



***IAPD20 Virtual***

*13-17 September 2020*



*Staying Connected*

# ***Abstract Book***

# ***IAPD20 Virtual***

# *Invited Speakers*



## **Improving Communication with New Generation Parents**

Andreas Agouropoulos

*Assistant Professor of Paediatric Dentistry National and Kapodistrian University of Athens*

### **Lecture Summary:**

The social changes that have taken place in the last 50 years, the instability of the economy, the evolution of technology and consequently the way people communicate, significantly differentiate the characteristics of the patients and mostly parents who come to the dental clinic. The purpose of this presentation is to describe the profile and characteristics of the parents and the communication challenges between them and the dental team and suggest ways to improve this communication.



## **LGA in Children: Any Concerns?**

Eduardo Alcaino

*BDS (Hons) MSc (Paediatric Dentistry) FRACDS (Restorative Dentistry) MRACDS (Paediatric Dentistry) Grad Dip Clin Dent (Sedation & Pain Control)- USYD Master Int. Business/Law - USYD Specialist Paediatric Dentist Specialist Clinical Associate- University of Sydney Visiting Specialist Westmead Centre for Oral Health Principal - Sydney Paediatric Dentistry P/L*

### **Lecture Summary:**

This lecture will address current thinking and techniques used for the delivery of dental care for children under general anaesthesia (GA).

As all procedures performed under GA, there are concerns for the parents, the hospital, the anaesthetist and the dentist performing the procedure. Furthermore, issues relating to informed consent will be addressed. Have we offered other forms of treatment before suggesting a general anaesthetic?

Ethically, should we as professionals recommend GA for treatment for children under 24 or 36 months for Early Childhood Caries (ECC) where there are no symptoms or pulpal involvement? What about recent reports which imply that the use of anaesthetic drugs can affect the cognitive development of children years later?

This presentation will address the above questions and provide current thinking and literature to this effect.



## **LectuZirconia Crowns, How and When?**

Jorge Casian

*Private practice as Pediatric Dentist and Orthodontist, Veracruz. Former President of Mexican Academy of Pediatric Dentistry*

### **Lecture Summary:**

Pediatric zirconia crowns represent an alternative for treating severely damaged primary and young permanent teeth. This presentation will include the utilization of bioactive materials for pulpotomy procedures, as well as the correct case selection for restoring with zirconia crowns. New products for treating hypomineralized primary and young permanent teeth will be review as well as some special applications and complicated cases.



## **Endodontics in Young Permanent Teeth**

Zafer Cehreli

*DDS, PhD*

*Professor, Department of Pediatric Dentistry Faculty of dentistry Hacettepe University, Ankara*

### **Lecture Summary:**

Endodontic treatment of young permanent teeth presents a strong challenge to the clinician, irrespective of the level of pulpal involvement. This presentation will provide an overview of vital, non-vital and regenerative treatment options in young permanent teeth and will compare their efficacy in light of current literature and case presentations.



## **Parent Refusal of Topical Fluoride in Pediatric Dentistry: Causes, Consequences and Clinical Management**

Donald Chi

*UW*

*DDS, PhD*

### **Lecture Summary:**

Increasing numbers of parents are refusing topical fluoride treatment when visiting the dentist. The goals of this presentation are to provide attendees with the latest research on the causes of topical fluoride refusal and potential consequences for the specialty of pediatric dentistry as well as on goals to achieve oral health equity for all. The presentation will also provide attendees with strategies on how to identify and manage topical fluoride refusal behaviors in clinical settings.



## **Evidence-Based Clinical Practice Guidelines- Why, What, & How?**

Vineet Dhar

*BDS, MDS, PhD*

*Professor & Chair, Department of Orthodontics & Pediatric Dentistry, Graduate Program Director, Pediatric Dentistry, University of Maryland School of Dentistry, Baltimore*

### **Lecture Summary:**

Now-a-days both clinicians and patients have ready access to the health information from the comfort of their offices or homes. Although online information is a great resource, it can be challenging to evaluate the available literature in terms of quality of data, and reliability of the estimated effect. The clinicians are expected to use preventive and disease management strategies that are evidence-based, and patient centered. This aim of this presentation is to explore evidence-based dentistry focusing on the need, implementation, and interpretation of clinical practice guidelines to provide high quality patient-centered care.



## **From Pulp Therapy to Biological Management: My Journey through Evidence Driven Evolution of Care for Children**

Monty Duggal

*Vice Dean and Faculty Research Director National University Centre for Oral Health, Singapore (NUCOHS)*

### **Lecture Summary:**

As an experienced paediatric dentist the speaker has witnessed an evolution in restorative care of children, some of it driven by high quality science. This has had a profound influence on my own understanding of pulp biology, the reaction of the pulp to injury through caries, and the healing possibilities of the inflamed pulp. My own practice has tended to now include a lot more biological approaches rather than the radical treatments that I learnt as a young paediatric dentist. Some conventional paediatric dentists react against such approaches. However, they do so at their peril as overwhelming evidence cannot be ignored and our practice should deliver only evidence based treatments for a child. In this talk I will take the participants through my own personal journey, my insecurities as a conventional paediatric dentist when faced with new evidence and how I have now tailored my clinical practice to build on the good evidence and to discount and discard the weak one.



## **Pulp Therapy for Primary Teeth**

Mani Ekambaram

*University of Otago*

### **Lecture Summary:**

Pulp therapy in primary teeth aims to preserve the teeth until its natural exfoliation. The preserved primary teeth act as a natural space maintainer for eruption of succeeding permanent teeth. This presentation aims to summarise different pulp therapy options for primary teeth and relevant research evidences to support such procedures.

## **Hypomineralized Second Primary Molars**

Marlies Elfrink

*PREP, Paediatric Research Project Mondzorgcentrum Nijverdal*

### **Lecture Summary:**

The interest in HSPM is increasing, also shown by the increasing numbers of articles. In this lecture, the epidemiology, clinical scoring criteria, characteristics of the enamel and the treatment will be discussed.



## **Learn...Re-Learn: The New Behaviour Re-Alignments**

Varinder Goyal

*MDS, MFDS, RCPS*

*Professor & Head, Department of Paediatric & Preventive Dentistry, Guru Nanak Dev Dental College & Research Institute, Sunam*

### **Lecture Summary:**

Can You Still use your Convention Behavior Management Techniques? Would the New Dental Clinic Protocols Be Child Friendly; How to Manage Fear of Child to PPE?



## **Infant Oral Mutilation: The Silent Public Health/Child Abuse Issue**

Arthur Kemoli

*BDS (UoN), DGDP RCS (Eng), MSc (UvA), PhD (UvA), FICD*

*Faculty Member, Department of Paediatric dentistry and Orthodontics, University of Nairobi*

### **Lecture Summary:**

Infant Oral Mutilation (IOM) is a harmful dental traditional practice carried out by some African communities and involves the removal of primary canine toothbuds in children under 2 years. The practitioners use crude, unsterile instruments without and anaesthesia to undertake the operation. The results have been the high morbidity and mortality in these children, resulting from soft and hard dental tissue damage, haemorrhage, shock, septicaemia and death, besides the damage caused to the primary and succedaneous dentition and the occlusion in general of the child involved.



## **Better Breathing, Better Sleep: It's Never Too Early**

Stanley Liu

*Stanford University School of Medicine, Department of Otolaryngology, Division of Sleep Surgery, Stanford, California*

### **Lecture Summary:**

There is a significant contribution to the pathogenesis of obstructive sleep apnea (OSA) by aberrant facial and airway development. Early intervention in growing individuals can be highly effective in treating and preventing symptoms of OSA. My talk will focus on the importance of form and function as a dual target for treatment in growing individuals. In my opinion, pediatric dentists will be society's first-line healthcare professionals screening for at risk children in need of OSA treatment.



## **Lecture 17: The Understanding of Molar Incisor Hypomineralization (MIH)**

Susana Morales Uribe

*Faculty at the Pediatric Dentistry Graduate Program, University of Costa Rica, San José, Private Practice, Cartago*

### **Lecture Summary:**

Understanding the enamel formation process. Provide an overview of new scientific evidence of MIH. Review prognosis, diagnostic and treatment of MIH pathology.





## **Today's Parenting Styles and the Etiology of Child Behavior in the Dental Setting**

Amr Moursi

Professor and Chair, Department of Pediatric Dentistry New York University, College of Dentistry Vice President,  
American Academy of Pediatric Dentistry

### **Lecture Summary:**

Most pediatric dentists believe that parenting styles have changed dramatically in recent years. This presentation will discuss how today's changing parenting styles can influence the selection, and effectiveness, of our behavior guidance techniques. The factors that comprise the etiology of behavior will also be discussed. These factors, which can determine a particular child's behavior, such as cognitive development, temperament, and fears, can also be strongly impacted by parenting style. This presentation will also describe patient behavioral assessment and an approach to customize behavior guidance techniques to individual patients, and their parents, in order to provide care that is safe, effective and efficient.



## **Orthodontic Essentials for Paediatric Dentists**

Kitae Park

*D.D.S., M.S., Ph.D.*

*Department of Pediatric Dentistry Samsung Medical Center Sungkyunkwan University School of Medicine*

### **Lecture Summary:**

This presentation is not to introduce any orthodontic techniques, but to provide essential orthodontic concepts for my fellow pediatric dentists.

In dealing with orthodontic problems in children, it is important to understand the patient's overall problem and to develop a good strategy for proper treatment timing as well as deciding whether to start treatment. The overall problem includes the complexity of the orthodontic problem itself plus the psychological variables relevant to the child. For this presentation, various clinical cases will be reviewed to clarify which strategy we should use to obtain the most beneficial results for our patients.



## **Understanding Bioactivity and S-PRG Technology for Help Solving Daily Paediatric Dentistry Concerns**

Daniela Rios

*Associate Professor of the Department of Pediatric Dentistry, Orthodontics and Public Health, Bauru School of Dentistry, University of São Paulo*

### **Lecture Summary:**

Nowadays we have two main challenges to deal in the Pediatric Dentistry clinical practice: dental caries and development dental defects, mainly hypomineralization. Considering that these alterations bring many consequences for the child, family and society, their management is necessary. On this scenario, the bioactive materials are important tools that can help the professionals. However, the understanding of their mechanism of action, indications and operating instructions are fundamental for promoting oral health.



## **Community-Based Approach to Reducing Caries**

Francisco Ramos-Gomez  
*IAPD Membership Committee*

### **Lecture Summary:**

Caries lesion in children can be arrested at any stage of lesion development provided that community interventions are maintained.

Professionals must become aware of the importance of early identification of disease and individuals at high risk of developing caries so that they may receive early preventive intervention, especially on the COVID era with minimal use of aerosols and minimally invasive dentistry.



## **Remineralization Versus Sealing and Infiltration: The Good and The Evil or The First and Second Line in Early Caries Management?**

Falk Schwendicke  
*Prof. Dr., MDPH*  
*DMG Dental-Material Gesellschaft mbH*

### **Lecture Summary:**

Growing evidence finds less invasive strategies efficacious for managing carious lesions. Caries sealing and infiltration are innovative concepts for this purpose. Especially on proximal surfaces, both have significant advantages over traditional restorative care. In the lecture, both concepts are described and indications and limitations discussed. The efficacy of the two strategies is assessed based on a recently published systematic review and meta-analysis. It will be demonstrated how sealing and infiltration can reduce the risk of lesion progression. The need for a clinical and often also radiographic diagnostics are discussed and tips for the practice given.



## **Management of Dental Injuries to the Periodontal & Supporting Structures Following Trauma: An Evidence-based Approach**

Nikhil Srivastava  
*Professor & Head, Pediatric and Preventive dentistry, Principal, Subharti Dental College & Hospital Dean, Faculty of Dental Sciences, Swami Vivekanand Subharti University*

### **Lecture Summary:**

Management of traumatic dental injuries is a great challenge for pediatric dentists particularly when the injured person is in a growing phase. Due to the malleability of bone, many a time, injury causes socket expansion as a result, a traumatized tooth may become mobile, moves in a different position, or in the worst-case scenario, comes out of its socket. This presentation will discuss the etiology, favorable & unfavorable outcomes, and evidence-based management of different types of dental injuries involving periodontal & supporting tissues.





### **Keys to Practice Success**

William Waggoner

*D.D.S., M.S., F.A.A.P.D, F.A.C.D  
Private Practice, Las Vegas, NV*

#### **Lecture Summary:**

Creating and running a successful private practice is a daily challenge. The formation of systems, a dynamic culture, and consistency of implementation are particular ingredients to success. This presentation will discuss various practices and systems that have lead to a successful and rewarding clinical practice.



### **A Child's Face - Looking versus Seeing**

Richard P Widmer

*MDS, FRACDS*

*Paediatric Dentist, Head of Department & Senior Staff Specialist, Paediatric Dentistry, A /Prof –University of Sydney The Children's Hospital at Westmead, SYDNEY*

#### **Lecture Summary:**

The description of facial appearance and it's importance in diagnosis.

**Description:** The recognition of a the way infants and children grow –physically , socially ,intellectually – is paramount to recognising the subtle variations in appearance that present each day in our clinics . With this understanding clinicians can provide a more detailed examination, diagnosis and treatment plan for their child patients.



### **Are X-rays Still an Option in Paediatric Dentistry?**

Juan F. Yepes

*DDS, MD, MPH, MS, DrPH*

*Professor of Pediatric Dentistry Department of Pediatric Dentistry, Attending Riley Hospital for Children Indiana University School of Dentistry*

#### **Lecture Summary:**

This lecture will provide to the attendee the most updated information about the safe use of ionizing radiation with children in the dental office. The webinar will discuss the most effective techniques to decrease the amount of radiation to the pediatric patient as well as other non-ionizing imaging techniques.



## **Better Breathing, Better Sleep: It's Never Too Early**

Audrey Yoon

*University of Pacific Arthur A. Dugoni School of Dentistry Department of Orthodontics Honorary Assistant Professor, The University of Hong Kong, Faculty of Dentistry Orthodontics Clinical Faculty/Lecturer , University of California, Los Angeles, School of Dentistry Department of Pediatric Dentistry*

### **Lecture Summary:**

There is a significant contribution to the pathogenesis of obstructive sleep apnea (OSA) by aberrant facial and airway development. Early intervention in growing individuals can be highly effective in treating and preventing symptoms of OSA. My talk will focus on the importance of form and function as a dual target for treatment in growing individuals. In my opinion, pediatric dentists will be society's first-line healthcare professionals screening for at risk children in need of OSA treatment.

# ***Behaviour Guidance***

### **Diagnosis of Infant Bruxism: A Review of the Literature to Assist the Dentistry**

Laura Simoes Siqueira<sup>1</sup>, Tamara Ripplinger<sup>2</sup>, Carina Machado<sup>3</sup>, Catiara Costa<sup>4</sup>

<sup>1</sup>*Post Graduate Student in Pediatric Dentistry, Federal University of Pelotas, Pelotas, Rio Grande Do Sul, Brazil*

<sup>2</sup>*Post Graduate in Pediatric Dentistry, Federal University of Pelotas, Pelotas, Rio Grande Do Sul, Brazil*

<sup>3</sup>*Graduation in Dentistry, Federal University of Pelotas, Pelotas, Rio Grande Do Sul, Brazil*

<sup>4</sup>*Orthodontics Teacher and Post Graduate in Pediatric Dentistry, Federal University of Pelotas, Pelotas, Rio Grande Do Sul, Brazil*

**Background:** Bruxism is defined as a parafunctional habit characterized by repeated clenching of the teeth in an unconscious way, which may be associated with occlusal interference or psychological factors, occurring during sleep or waking state. The aim of the present study was to analyze the pertinent literature about diagnosis of children bruxism, in order to assist the dental professional in the recognition this condition.

**Methods:** Through databases PubMed, Scielo and Lilacs, searching the specific terms the literature, was reviewed and article selection by two independent examiners. The criteria established for research were children from 0 to 12 years of age, independently of sex, year or geographical context.

**Results:** Initially, 1409 articles were identified. After the exclusion of duplicates, evaluation of titles, abstracts and full text, 42 articles were totaled. A table was drawn to extract data and through this the studies were mapped according to the following categories: title, author (year of publication), type of study, age of participants/sample size and method of diagnosis.

**Conclusion:** The association between clinical examination and report of parents, with a specific criteria, suggests a good conduct for the dentist. Although polysomnography is considered the gold standard method, it depends on financial conditions and management, mainly in the case of children. Therefore, the association between clinical examination and report of those responsible, with specific criteria, proved to be a good method for the dentist.

### Temperamental Trait and Behavior in Pediatric Patients under Dental Treatment

Maria Lilia Juarez-Lopez, Murrieta-Pruneda Francisco, Martinez Katy  
*FES Zaragoza, UNAM, CDMEX, Mexico*

**Background:** During dental treatment, the child's collaboration enables an effective treatment. The behavior of the pediatric patient is related to innate and acquired factors. Temperamental features influence on the ability to react and respond to any stimulus, and its analysis is important in the pediatric patient who is attending in dental office. The objective is associating age and temperamental traits with behavior during pediatric dental treatment.

**Methods:** A total of 140 patients aged 3 to 10 years who attended dental consultations were included in a cross-sectional and analytical study. The child's dominant temperamental trait was determined through a survey of temperament including activity, emotionality and socialization. The questionnaire was based on the Buss and Plomin Temperament Survey (EAS) and applied to parents. For the type of behavior that children during dental treatment, the Frankl criteria were considered. Kendall Tau nonparametric correlation coefficient was applied for data.

**Results:** The dominant temperamental trait was not decisive for the type of behavior.  $p > 0.05$ . Age was associated with negative behaviors.  $p > 0.05$ .

**Conclusions:** In this study, negative behaviors occurred more frequently in children younger than 5 years and were not related to the dominant temperamental trait.

## Evaluation of Infection and Control Knowledge Attitude and Practices among a Group of Egyptian Postgraduate Dental Students

Dalia Moheb<sup>1</sup>, Norhan El Dokky<sup>2</sup>

<sup>1</sup>*Pediatric Dentistry and Dental Public Health, Cairo University- New Giza University, Cairo, Egypt*

<sup>2</sup>*Pediatric Dentistry and Dental Public Health, Cairo University, Cairo, Egypt*

**Background:** Despite the extensive progress in the field of infection control in recent years, and emphasis placed on the importance of strict adherence to these protocols, pitfalls are still recorded in this regard in different universities, clinics and offices. It is of great importance to assess the efficiency of infection control in universities. The aim of this study was to investigate the knowledge, attitude, and practice regarding the recommended infection control measures among postgraduate students in several dental schools.

**Methods:** A cross sectional study was conducted among a group of postgraduate students using a self-administered questionnaire to evaluate their level of knowledge, attitude, and practice regarding infection control measures.

**Results:** The response rate was 96%. Interesting areas were: Only 40% of the sample displayed the proper method of washing hands. Moving around while wearing face masks and protective gowns was reported by 32% and 28% of the sample, respectively. Data also showed that only 48% of the students had been vaccinated with required vaccines. Unfortunately, only 24% of sample displayed correct knowledge about the infections with the highest risk of transmission in the dental setting, whereas, 48% knew how to handle an accidental needle prick. The overall data showed the mean knowledge was 63.72%, attitude was 50.52% and practice was 60.42%. Knowledge scores ranged from 6-12/14; attitude scores were from 3-11/11 and finally practice scores from 2-9/10.

**Conclusions:** This study revealed inadequate levels of knowledge, attitude, and practices toward infection control and that more training in both educational and practical fields is required.



### **Pain Perception Based on Oxygen Saturation, Pulse Rate, Self-Report of Children Aged 6-9 Years Between Injection Using Buffered and Non-buffered Anesthetics**

Theodora Erlin Puspitasari, Iwan Ahmad Musnamirwan, Kirana Lina Gunawan, Meirina Gartika  
*Pediatric Dentistry, Universitas Padjadjaran, Bandung, Jawa Barat, Indonesia*

**Background:** Dental care procedures such as injections usually make children feel uncomfortable, uncooperative and cause pain. One of the pain control efforts to reduce pain related to administration of local anesthesia is buffered anesthetics. This research objective was to assess the pain perceptions based on oxygen saturation, pulse rate and self-report of the children between injection using buffered and non-buffered anesthetics.

**Methods:** The research method was quasi-experimental with sampling done by purposive sampling in 19 children. Pain perception based on oxygen saturation and pulse rate was measured using a pulse oximeter and for the self-report using Wong-Baker FACES® scale on both injection treatments. Statistical analysis used t-test and Mann-Whitney test with a significance level of  $\alpha$

**Results:** Research showed that oxygen saturation changed slightly after injection of buffered and non-buffered anesthetics 0.0002 (0.01). The pulse rate increased after injection of buffered anesthetics 0.00000832 (0.01) and non-buffered 0.000000438 (0.01). Buffered anesthetics was reported less painful than non-buffered anesthetics. The oxygen saturation and pulse rate value showed inversely proportional to self-report in children. Statistical analysis showed a significant difference between oxygen saturation 0.5 (0.01) and pulse rate 0.4886 (0.01), however there was a significant difference in the self-report 0.00000262 (0.01).

**Conclusions:** There are no difference in pain perception based on oxygen saturation and children`s pulse rate, but there is a difference in pain perception based on self-report between buffered and non-buffered anesthetics.

**Assessment of Oral Health Related Quality of Life in Patients Suffering from Systemic Diseases**

Kavita Dhinsa, Sonali Saha

*Department of Pediatrics & Preventive Dentistry, Sardar Patel Post Graduate Institute of Dental & Medical Sciences, Lucknow, Uttar Pradesh, India*

**Background:** Children with systemic diseases have higher risk of dental diseases. They have greater difficulties in performing the effective oral hygiene practices. However, till date there are very few studies that have considered the impact of dental diseases on quality of life. The aim of the study is to assess the oral health related quality of life (OHRQoL) among children suffering from Congestive Heart Failure (CHF) and Bronchial Asthma in Lucknow city.

**Methods:** 90 Patients aged 6-12 years were assessed using Child Perception Questionnaire (CPQ). DMFT was assessed in same patients to measure their caries experience.

**Results:** Dental caries were observed in 62.6% of cardiac patients followed by 55.8% in Bronchial Asthma patients.

**Conclusions:** Children with CHF had high dental caries experience as compared to Asthmatic patients. Due to high caries exposure they had a negative impact on OHRQoL as compared to others.

**Assessment of Reliability and Validity of the Contemplation Ladder in Dental Avoidant Adolescents**

Sonali Saha<sup>1</sup>, Kavita Dhinsa<sup>1</sup>, Abhay Mani Tripathi<sup>1</sup>, Arti Garg<sup>1</sup>, Gunjan Yadav<sup>1</sup>, Nishi Grover<sup>2</sup>

<sup>1</sup>*Department of Pediatric and Preventive Dentistry, Sardar Patel Post Graduate Institute of Dental and Medical Sciences, Uttar Pradesh, Lucknow, Uttar Pradesh, India*

<sup>2</sup>*Department of Pediatric and Preventive Dentistry, Saraswati Dental College and Hospital, Lucknow, Uttar Pradesh, India*

**Background:** The Trans-theoretical Model recognizes change as a process involving progress through a series of stages. According to this model, it is important to assess the stage of change a dentally avoidant individual is in and use this information to select stage appropriate interventions. One promising instrument to measure the stage of change is the “Contemplation Ladder”. This Ladder might be useful to predict readiness to go to a dentist in individuals who are dentally avoidant. Hence the present study was carried out to analyze the factors and determine correlation between ladder scores, attitude towards oral health and future intentions to go to a dentist.

**Method:** A cross-sectional study comprising of 200 students aged 11-15 years was conducted. Ethical Committee Clearance and Informed Consent was obtained prior to the study. Basic Demographic data was noted. Oral examination was done according to WHO criteria to study Dentition Status and Treatment Needs. Data was obtained from study subjects based on scoring of the Contemplation Ladder. Other questionnaires used in the study included Modified Dental Anxiety Scale, Dental Neglect Scale and Revised Dental Beliefs Survey. Data was analyzed using SPSS Version 21.0. One-way Anova, Chi square and Fischer’s Exact test was used for comparison of categorical data.

**Results:** There was no relationship between age or gender and Ladder scores but a significant relationship between Ladder scores and number of decayed teeth and dental fear was found.

**Conclusion:** We have found a good evidence for the reliability and validity of Contemplation Ladder.

**COVID-19 Disease and Paediatric Dentistry: A Review on Dental Management**

Martina Quaraniello<sup>1</sup>, Tiziana Cantile<sup>1</sup>, Fulvia Desiderio<sup>1</sup>, Cristina Papa<sup>1</sup>, Aniello Ingenito<sup>1</sup>,  
Gianmaria Fabrizio Ferrazzano<sup>1,2</sup>

<sup>1</sup>*Department of Neuroscience, Reproductive and Oral Sciences, Paediatric Dentistry Unit,  
“Federico II” University, Naples, Italy*

<sup>2</sup>*Staff Member of UNESCO Chair on Health Education and Sustainable Development, “Federico  
II” University, Naples, Italy*

**Background:** Coronavirus disease 2019 (COVID-19) has spread rapidly across the globe, becoming a major public health challenge for countries around the world. The viral transmission is through droplet inhalation, as well as contact transmission via oral, nasal and eye mucous membranes. In dentistry, most procedures generate significant amounts of droplets and aerosols, posing potential risks for viral transmission. The risk of spreading the virus is more serious in paediatric dentistry, because children are often asymptomatic. The aim of this study was to carry out a narrative review on dental management in paediatric dentistry, during and after the COVID-19 pandemic, in order to ensure higher safety standards for both dentists and children.

**Literature Review:** The literature research was performed using the PubMed database. The following keywords were used: “COVID-19 and Paediatric dentistry” and “COVID-19 and dentistry and children”. The results of this literature research showed that dentists should avoid or minimize operations that can produce droplets or aerosols (Aerosol Generating Procedures) (AGP): four hands technique, rubber dam, double and high-volume saliva ejectors, anti-retraction hand-pieces and hand instruments are strongly suggested in order to contrast viral spread. Furthermore, when possible, Minimally Invasive Treatments (MITs), like Atraumatic restorative technique (ART), Interim therapeutic restorations (ITR), the Hall technique (HT) and the use of Silver Diamine Fluoride (SDF), should be considered.

**Conclusion:** Wherever possible, it is recommended to avoid elective AGP. Moreover, paediatric dentists should keep a high level of awareness to help patients, minimizing risk and preventing viral spread.

**Improving Communication with Children with Dental Anxiety in Turkey using the ‘Message to Dentist’**

Aliye Tugce Gurcan<sup>1</sup>, Busra Aydin<sup>2</sup>, Elif Ayse Tamtekin<sup>1</sup>, Zoe Marshman<sup>3</sup>, Gulce Esenturk<sup>1</sup>,  
Bugra Ozen<sup>1</sup>

<sup>1</sup>*Pediatric Dentistry, Faculty of Dentistry, Altinbas University, Istanbul, Turkey*

<sup>2</sup>*Private Dentist, Ozel Dental Implant Clinic, Istanbul, Turkey*

<sup>3</sup>*Dental Public Health, School of Clinical Dentistry, The University of Sheffield, Sheffield, UK*

**Background:** This study aimed to evaluate the Turkish version of the ‘message to dentist’ (MTD) with children attending two dental settings.

**Methods:** Children aged 5-16 years attending a dental faculty clinic and a private dental office were invited to complete the MTD proforma. Children were asked to report how worried they felt, their level of pain they anticipated and the actual level of pain they experienced on a scale of 1-10 (with 1 being the best outcome).

**Results:** In total 185 children completed the proforma including 84 from the faculty clinic and 81 from a private dental office. The mean age was 8.3 years and 55% were female. Before treatment, the mean reported level of anxiety was 5.5 with the most commonly reported causes of anxiety being injections (37%) and extractions (15%). There was a significant reduction in anticipated pain from 4.6 to 2.1 (p0.05, paired t-test). Following treatment, children reported feeling pleased their treatment did not hurt (35%) and that their teeth were no longer symptomatic (18%). The most commonly reported rewards from their parents for making progress with treatment included playing games on a computer or mobile telephone (23%) or watching television (16%).

**Conclusions:** The MTD proforma was useful to show how children’s anticipatory fear and pain levels reduced following treatment and to identify their specific causes of concern.

Behaviour Guidance, Special Needs Patients

### **PJS- Pictorial Scale (PJS-PS): Anxiety Rating Scale for Speech & Hearing Impaired Children**

Jaikiran Kaur

*Department of Pediatric and Preventive Dentistry, Indira Gandhi Institute of Dental Sciences,  
Puducherry, Puducherry, India*

**Background:** The strength of pediatric dentistry, which differentiates us from the other fields in dental sciences is “behavior guidance”. Fear and anxiety are primary concerns in pediatric patients and have to be taken into consideration for the speech and hearing impaired children too. In this study, an innovative anxiety scale PJS Pictorial Scale (PJS-PS) was designed for the speech and hearing impaired children. Introducing a newer concept of pictorial representation of most common emotions using sign language in the dental clinic can improve communication and also help in coping up and bringing out positive behavior in this group of special children. The study aimed to validate and assess the efficacy of PJS-PS for speech and hearing impaired children.

**Methods:** A total of 30 children of age 6-12 years from the special school were selected for the study. PJS-Pictorial scale was used to determine the pretreatment anxiety scores in the speech and hearing impaired children.

**Results:** The validity of the PJS-PS in the pretreatment anxiety in the assessment of child`s dental anxiety is supported by expert opinions, value of frequency of choices and receptiveness by the children.

**Conclusions:** The PJS-PS can be reliable anxiety assessment scale for measuring child`s dental anxiety among speech and hearing impaired children. It can be used in combination with other methods as well to improve assessment of dental anxiety.



### Child Coping Styles and Dental Anxiety: Is it Related?

Hitakshi Kathiria, Anup Panda, Mira Virda

*Department of Paedodontics and Preventive Dentistry, College of Dental Science and Research  
Center Bopal Ahmedabad, Ahmedabad, Gujarat, India*

**Background:** Children face a moderate to high degree of dental related stress that can have behavioral consequences resulting in compromised dental treatment. It is thus important to examine how children manage to cope with stressful visits to the pedodontist. Based on Miller's coping style, a study was conducted with an aim to find a relationship between anxious children to different coping styles that could help the pedodontist develop a treatment plan for the child to facilitate effective coping.

**Methods:** Anxiety level of 100 children (8 to 12 years) was measured using a modified child dental anxiety scale - faces version. They were asked to complete a form (monitoring blunting dental tool) in which certain dental situations along with their appropriate options were given. Children were asked to answer in yes or no to the options. Scores were calculated individually for monitoring and blunting and the highest score was taken as the coping style of that particular child. The data was then statistically analyzed.

**Results:** Descriptive statistics was done for each variable. The mean age was 9.6 years and the mean anxiety score was 21.96. A Chi-square test was performed to examine the relation between the anxiety level and coping strategy, and it was found to be non-significant ( $p .05$ ). However, children with moderate to high anxiety preferred monitoring coping style than blunting.

**Conclusions:** Monitoring - Blunting coping style is effective in reducing a child's dental anxiety in the dental office.

### **Randomized Controlled Study Regarding the Influence of Music Therapy on the Vital Signs of Pediatric Patients during Pulp Treatment**

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**Background:** Music therapy (MT) consists of interaction between music, application medium, professional and patient. The pediatric dentists challenge is managing the children behavior, since high levels of anxiety can limit the effectiveness of dental treatment. Marwah et al., and Prabhakar et al., evaluated the effect of MT on dental anxiety in children and found no significant decrease. However, Dixit and Jasani demonstrated decrease in blood pressure during dental treatment; they recommended further research is required to assess MT on dental treatments that cause pain. The purpose of this study was to evaluate the influence of MT on the vital signs during pulp treatment.

**Methods:** Children requiring pulpotomy in primary dentition were randomly assigned, in two groups: music therapy and control. Blood pressure, oxygen saturation, heart and respiratory rate were recorded before, during and after the procedure in both groups. Descriptive statistical analysis and t-Student were performed.

**Results:** 25 children were studied, 12 in the MT group with mean age of 5.4, and 13 in the control group with mean age of 5.7. There were no significant differences in vital signs before, during and after the intervention, with the exception of blood pressure that increased in the group control, with a statistically significant difference  $t=2.345$  with a .05 level of significance.

**Conclusions:** Although MT did not show an effect on vital signs, it is recommended as a support technique in pediatric dentistry to achieve a state of tranquility.

**How has the COVID-19 Pandemic Affected the Psychology of Pediatric Dentists, Parents, and Children**

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**Background:** To assess the psychological burden of practicing pediatric dentistry during the COVID-19 pandemic outbreak; on dentists, parents and children.

**Methods:** The study population consists of pediatric dentists, recruited through five pediatric dentists Facebook groups. A web-based questionnaire was created; the questionnaire contained closed and open-ended questions, addressing demographic data, dentists' feelings, and how they deal with children and parents in clinic. Descriptive statistical analysis was used to describe items included in the survey. Numbers and percentages were used to describe categorical data.

**Results:** 202 dentists responded to the questionnaire of which 141 dentists are actively practicing during the pandemic. 85.1% of practicing dentists felt anxious regarding their own safety, and for 61.7% of them, this may affect their attitude and tolerance with a child patient. 57.5% of respondents felt that the general stressful situation of the pandemic is affecting/may affect their attitude and tolerance with child patient. 68.8% and 93.6% thought the situation will/may affect child's and parents' attitude in dental office respectively. The effect of the sight of advanced PPE on children; had no effect (27.7%), interesting and curious (31.9%), apprehensive (30.5%). 56% of dentists reported the use of basic management techniques as usual, and only 42.6% would use tell-show-do technique and allow patients to touch dental instruments. 47.5-73% indicated not using advanced management techniques during the pandemic.

**Conclusions:** The stressful environment created by the pandemic is affecting dentists and parents more than children. This situation may limit the options usually used by dentists to manage children.

### **The Effect of Different Non-Pharmacological Methods in the Management of Pediatric Patients' Dental Anxiety and Behaviour, a Randomized Control Study**

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**Background:** Dental fear and anxiety expressed by children in the dental office during treatment, have been found to be one of the most real challenges for pediatric dentists. Behavioral management is one of the most reliable methods to deal with and reduce the effect of dental anxiety on children.

**Methods:** This randomized controlled clinical trial was conducted on 42 children, aged 5-12 years, who attended the pediatric dental clinics at College of Dentistry, Taibah University, Medina, Saudi Arabia. Following parents' consent and child assent, children were randomly divided into three groups; "A", "B" and "C", with 14 children in each group according to the behavior management technique used. "A" using audio-visual aids, "B" Parental presence in dental operatory and "C" Tell-Show-Do (Control group). All dental procedures requiring local anesthesia were included. Facial Image Scale (FIS) and pulse oximeter were used to assess the anxiety of children.

**Results:** Among the total of 42 children, 27 were boys (64.3%) and 15 were girls (35.7%). No significant difference was seen in FIS between all groups (p. value = 0.663). However, the mean pulse rate varied with significant difference between all groups (p. value = 0.014). It was found that dental injection was the major reason of dental anxiety (38.1%), followed by pain (33.3%). Tell-show-do, in general, reduced anxiety in comparison to other methods.

**Conclusion:** Tell-Show-Do was the most accepted non-pharmacological behavior method for children according to FIS and Pulse rate results. The major reason of fear and dental anxiety was dental injection.

### **A Virtual Twist on Pre-Appointment Behaviour Modification in Paediatric Dentistry: A Pilot Study**

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**Background:** One of the greatest causes of paediatric dental anxiety is the fear of the unknown. This study aimed to investigate the effectiveness of technology as a tool to reduce this fear and consequently increase intra-appointment cooperation.

**Methods:** Participants were ten 5-7-year-old children who had no previous dental encounters. The parents of five children were sent a virtual pre-appointment message, encouraging a calm approach when bringing their child to their appointment. Prior to the dental examination on the appointment day, participants of both groups were asked to self-report their current emotional state using the Facial Image Scale. Additionally, the dentist noted the patient's cooperation level using the Frankl Behaviour Scale. The experimental group were then shown a pre-recorded video of a paediatric dental examination before proceeding to have their own. After their dental examinations, all participants' anxiety levels were reassessed using the same two scales. Findings from the experimental group were compared to those of the control group, who were not sent a pre-appointment message nor shown the video.

**Results:** Patients who were sent the pre-appointment message and shown the video exhibited a more notable decrease in anxiety after the appointment, as compared to the control group.

**Conclusion:** It is evident that technology can be a useful medium for paediatric dental anxiety management. Additionally, this virtual behaviour guidance tool may possess increased value during the current global pandemic, where virtually desensitising children to the dental environment may translate to fewer number of behaviour shaping visits to the clinic.

## **Dental Anxiety/fear and Its Determinants in 6-15 Year-olds Children in Banja Luka, Bosnia and Herzegovina**

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**Background:** Dental anxiety/fear (DAF) has been recognized as a serious health problem. Children with DAF often try to avoid dental treatment which reflects on their oral health. The aim of this study was to assess the prevalence of DAF and its determinants among children aged 6-15 years using Dental Subscale of the Children's Fear Survey Schedule (CFSS-DS).

**Methods:** The sample comprised of 72 (6-15-year-olds) patients of the Dental clinic, Department of Preventive and Paediatric Dentistry, Faculty of Medicine University of Banja Luka. The study population was categorized based on age in two age groups: 6-10-year-olds (n=18) and 11-15-year-olds (n=54) and based on sex (37 girls and 35 boys). The CFSS-DS questionnaire was completed by the parents during the visit to the dental clinic. The data obtained through the questionnaires were analyzed using Chi-Square test.

**Results:** The mean score for CFSS-DS questionnaire was  $23.59 \pm 7.91$ . Dental fear with CFSS-DS  $\geq 38$  was identified only in 4 girls (5.55%). Fear score were highest on factors "drilling", "injection", and "choking". Statistically significant difference between age groups was noted in factors: "fear of doctors" (p0,05) and "open mouth" (p 0,01). Statistically significant difference between boys and girls was only for factor "injection" (p 0,05).

**Conclusion:** The highest level of DAF in children in our study was from drilling and injection. An assessment of dental fear should be made before dental treatment so each child could be successfully treated according to the reason for the fear. Keywords: children, dental fear, CFSS-DS questionnaire



### **How Do School Children View Other Children Who Have Visible Enamel Defects in Sharjah, United Arab Emirates?**

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**Background:** Physical appearance refers to the way someone looks, not only can it affect how individuals feel about themselves, but it may also be influenced by how other people visually judge them. The aim of this study was to evaluate how school children in the Emirate of Sharjah view their peers who have visible enamel defects?

**Methods:** A cross-sectional study design using randomized clusters sampling of public schools in the Emirate of Sharjah was conducted. Children in grade 6, aged 11-12, and grade 8 aged, 13-14, from randomly chosen schools were invited to participate in the study. The primary investigator distributed the questionnaire packs randomly, and each pack contained photographs of either subjects with enamel defects or subject without enamel defects. Statistical tests (t-test and linear regression analysis) were used to determine whether there were any statistically significant differences in the mean total attribute score (TAS) as the dependant variable and the independent variables: gender and year group (age).

**Results:** Using a four-point Likert scale, children completed the attribute questionnaire to rate the photographs according to descriptive questions. TAS was found to be significantly lower among enamel defects' photographs compared with photographs without enamel defects (p-value 0.004). For the age (grade) the value of TAS significantly increased by the increase of the age (grade) (p-value 0.035). Gender, however, did not have any significant effect on mean TAS.

**Conclusion:** Visible enamel defects influenced the social judgments of children on their peers.

Behaviour Guidance, Periodontal Disease in Children

### **Implications in the Use of Systematic Desensitization and Electric Toothbrushes in the Control of Bacterial Plaque. Case Report**

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**Introduction:** Gingivitis is highly prevalent among Chilean children. The removal of biofilm and calculus by the dentist, can be uncomfortable for the pediatric patient, there are different to management techniques, including adaptive techniques, such as systematic desensitization and the use of general anesthesia. Education on hygiene methods is essential to maintain the results of the treatment at home, accompanied by hygiene elements such as manual or electric toothbrushes and dental floss. The purpose is to present how progressive desensitization and the use of an electric toothbrush contributed to restore oral health to the patient.

**Case Report:** After informed consent, this 9-year-old patient, who was referred to our clinic for dental cleaning under general anesthesia was treated instead with systematic desensitization. Initially, generalized bacterial deposits and caries were seen. Gingival and rehabilitative treatment was performed, but during a posterior control no progress was shown. Manual toothbrush was replaced by an electric one, changing gingival health.

**Discussion:** The use of progressive desensitization as an adaptation technique contributed to the conventional care of the patient without having to resort for general anesthesia. Furthermore, the use of electric toothbrush according to the literature helps for a better control of biofilm and gingivitis compared to the manual one, but studies are still inconclusive.

**Conclusion:** In this case, systematic desensitization was the best resource considering the cost benefit in relation to general anesthesia. The transition from manual to electric toothbrush demonstrated improvements in biofilm control.

## Teleadaptation of the Pediatric Patient to the Dental Appointment

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**Background:** Teleadaptation arises as a complement to behavior management in response to physical and dental environment restrictions imposed by the current pandemic. Behavioral management techniques are the foundation for the balance in the relationship between Pediatric Dentist and child/guardian with the fulfillment of the objectives of promotion, prevention and treatment. The pediatric patient is the "bi-unit" child/guardian we must consider at the time we communicate based on assertive styles of communication according to each one.

**Methods:** Verbal and non-verbal communication, in addition to being informative, is interactive, dynamic, varied, paused and constantly taken up at different moments of the same dental treatment. To manage it, we have applied two styles of communication, one for tutor and another one for child, taking into account that both of them are experiencing negative influences by confinement, news, social media and uncertainty.

**Results:** Detailed and staged written digital content and videoconference to the parents/guardians, pre-filmed playful videos for each dental procedure, as well as colorful textiles and barriers to the children, are aids that positively impacted each of them in their acceptance upon return to the dental office. We found that children had positive behavior during dental procedures during this current pandemic. Dental experience was positive for our pediatric patients as well for the pediatric dentist.

**Conclusions:** Teleadaptation is a creative aid that acts remotely to adapt the pediatric patient to the safe return to the dental office and to achieve positive behavior during dental treatment.

### **Knowledge, Attitude and Eating Disorders among Children and Adolescents Engaged in Sports: A Cross-Sectional Study**

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**Background:** Prevalence of eating disorders is higher among athletes who are emphasizing on certain body type and weight. The purpose of this research was to assess the knowledge, attitude and practices regarding eating disorders among children and adolescents, engaged in sports. Bulimia nervosa, anorexia nervosa, binge eating disorder were included for this research.

**Methods:** A sample of 650 children and adolescents involved in various sports were recruited and divided into two groups on the basis of age, Group I: -10-14 years and Group II: -15-18 years. A self-instructed open-ended questionnaire was used for demographic details, collection of data to assess the knowledge, attitude and practices regarding bulimia nervosa, anorexia nervosa, and binge eating disorder based on DSM-V criteria.

**Results:** Data was analyzed using statistical package for the Social Science-21 (SPSS Inc, Chicago, USA). It was found that females, 51% in Group I and 76% in Group II were worried about their loss of control on eating. Participants in Group II were very vulnerable to develop anorexia nervosa and bulimia nervosa.

**Conclusions:** The future chances of developing an eating disorder related to bulimia nervosa and anorexia nervosa were found higher among adolescents 15-18 years of age. Deleterious effects due to such disturbed eating habits on general and dental health need to be addressed.

## **A Study of Drawing Shapes with Colour Method as a Projective Tool to assess Anxiety and Manual Dexterity to Toothbrush in Preschool Children**

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**Background:** Drawing is a mean of creative distraction and helps a child in projecting their anxiety. It helps in establishing a method for non-verbal communication along with acting as an indicator of manual dexterity in a dental office<sup>5</sup>. Hence, a study was planned to study the role of drawing as a tool to assess anxiety and manual dexterity (for toothbrushing) in pediatric dental patients.

**Methods:** A pilot randomized controlled trail was conducted on 30 children from the age group of 4-5 years. Children were asked to follow 'Copy the shapes technique'<sup>5</sup> and fill in colour according to their will from the set of 8 colour crayons. Colour selection was used as an instrument to analyze anxiety of the child and was compared to MDAS (Modified Dental Anxiety Scale) scoring and capability to duplicate the shape and color between the line was used to assess manual dexterity and compared with types of toothbrush grips, classified as per Beals D(1999).

**Results:** Red, purple and black colours were found to be preferred more frequently by anxious children as compared to others. However no statistically significant correlation was observed (p-value= 0.56). Defined grip of holding toothbrush was observed for children who could draw and colour between the lines. This finding established the relation between child oral hygiene and their manual dexterity.

**Conclusions:** This will help Pediatric Dentists to provide the child a better behaviour management by evaluating anxiety and post treatment brushing instruction as per their manual dexterity.

Behaviour Guidance, Cariology and Preventive Dentistry, Epidemiology

## **The Effect of Socioeconomic Class on the Oral Healthcare Practices of Secondary School Students in Lagos, Nigeria**

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**Background:** Secondary-school students are at a crucial stage in their life where decisions on oral health transit from the role of parents/guardians to their sole responsibility. Understanding factors that influence their oral healthcare practices is of paramount importance. Socioeconomic class (SEC) has been suggested to have a varied effect on oral health. Therefore, the aim of this study was to determine the effect of SEC on the oral healthcare practices of secondary school students

**Method:** A total of 385 secondary-school students in Surulere, Lagos, Nigeria were selected by multistage sampling method. Information collected via a self-administered questionnaire included socio-demographic characteristics, SEC using the family affluence scale by Currie 1997, oral hygiene practices, dietary habits, oral healthcare utilization and oral health perception. Data collected were analyzed using Epi Info statistical analysis software.

**Results:** A total of 370 students with a mean age of 14.95±1.44 participated in the study. 32% of the study population was of low SEC, 55% of middle class and 13% of high class. There were significant associations between high SEC and brushing twice daily (p0.05), using dental floss (p0.05), consuming carbonated drinks (p0.05) and oral healthcare utilization (p0.05). The mean OHI score was 1.12 and the higher the SEC, the better the OHI (p0.05). The prevalence of dental caries was 15% with mean DMFT of 0.25. Caries experience increased with SEC (p0.005).

**Conclusion:** Higher SEC led to better oral hygiene and oral hygiene practices but also led to poorer dietary habits and caries experience.

**Speak the Unspoken: The Efficacy of Two Screening Tools for Child Abuse in Clinical Set Up**

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**Background:** Child abuse and neglect are tragic realities of our Indian society. This presentation proposes a problem-based learning model that can effectively stimulate critical thinking skills to assist in screening and reporting suspected child abuse and neglect. The aim of the study is to evaluate the efficacy of two screening tools for child abuse and neglect which can be used in clinical settings.

**Methods:** Based on the inclusion criteria, 80 mothers of children under 14 years of age were included in the study. The parents were explained about the aim and objective of the study requested to fill in the questionnaire of the two screening tools of child abuse – PEDHITSS AND CTSPC- modified, which were statistically analysed to check their association with positive reports of child abuse.

**Results:** Mann Whitney and Kruskal wallis statistical tests revealed a positive correlation with reports of child abuse. ( $p = 0.056$ )

**Conclusions:** Educating the public about proper protocol when they suspect child abuse or neglect is imperative. By expanding their knowledge to include recognition and intervention, we clinicians can help break the cycle of violence and transform attitudes towards taking decisive action.

### **A Contemporary Behaviour Management Strategy to Establish Communication, Distraction and Reinforce Positive Behaviour among Uncooperative Children**

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**Background:** Uncooperative and disruptive behaviours in dental settings are a common manifestation of fear and anxiety in children. Children may be stubborn, non-compliant, may refuse to enter the operatory or open their mouths for examination. A novel way of dealing with these children is by performing magic tricks to distract them from the dental situation and achieve their cooperation. The purpose of this study was to compare the effectiveness of magic tricks with conventional Tell-Show-Do behaviour management technique among uncooperative children.

**Methods:** Children aged between 3-6 years with a baseline Frankl's behaviour rating scale of 1 and 2, having no previous dental experience were randomly selected and divided into two groups. Group-1 consisted of children to be managed by conventional Tell-Show-Do behaviour management technique and Group-2 by using magic tricks. Behaviour guidance was done to establish communication, distraction and reinforce positive behaviour. The child's behaviour was assessed at two consecutive appointments using Frankl's behaviour rating scale and Venham's behaviour rating scale.

**Results:** The results showed statistically significant difference in both the scales between the two groups in the first appointment with group-2 (magic tricks) showing more positive behaviour. The second visit also showed more positive behaviour in group-2 compared to group-1, though it was not statistically significant.

**Conclusions:** Children who were shown magic tricks demonstrated a more cooperative behaviour. Magic can be successfully used to establish communication and build rapport, distract and draw away attention, and positively reinforce the desired behaviour in the child.



### GA is not the Way

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**Introduction:** Moderate to severe dental anxiety affects 64% of 15 year olds and can severely impact their ability to receive dental treatment. Oftentimes treatment under local anaesthetic (LA) can only be achieved with effective pharmacological management of their anxiety.

**Case Report:** A 15-year-old female presented with dental pain on a background of severe dental anxiety. She previously underwent extraction of primary teeth under general anaesthesia (GA). Medical history was notable only for a family history of factor v Leiden. Clinical and radiographic examination revealed an extensively carious permanent dentition with unrestorable UR6 and LL7. UL4, UL5, LL6 and LR6 presented with restorable caries. The patient was insistent that she would not tolerate treatment without GA. Her dental anxiety was explored and it transpired that she was anxious about receiving LA due to a previous negative experience. Topical anaesthetic was discussed and she agreed to attempt treatment under LA. Following an intensive preventive regime, all restorative treatment and dental extractions was completed using benzocaine 20% topical anaesthetic and 4% Articaine as well as 2% Lignocaine for LA. Non-pharmacological behaviour management techniques such as tell-show-do, enhancing control, systematic desensitisation and distraction were also utilised.

**Discussion:** GA is a relatively safe and effective treatment modality for the anxious patient. However, the potential risks make it imperative to explore alternative options where possible, particularly in adolescent patients.

**Conclusion:** This case demonstrates the importance of using effective topical analgesia which, along with non-pharmacological behaviour management techniques facilitated the completion of treatment under LA.

Behaviour Guidance, Cariology and Preventive Dentistry

## **Analysis of Survey Responses Regarding an E-leaflet - Brushing and Diet Guide for Children during The COVID-19 Pandemic**

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**Background:** Covid-19 has led to a closure of many dental services, reducing the help and support for children and families. During COVID-19, many of the emergency calls were regarding children with a high caries risk. They were often:

- not registered with a dentist/thought their child was too young to see a dentist
- consuming a cariogenic diet
- not aware/motivated in maintaining good oral hygiene
- used to siblings having dental extractions due to caries

We were concerned that the decay rates for children may increase during the pandemic whilst children are at home and access to dentistry is limited. Our aim was to try target children with high caries risk by educating children and families in the form of an E-leaflet. The use of IT and technology has increased during the pandemic. Children are also familiar with E-learning.

### **Method:**

1. Information gathering – assessed current information within the trust.
2. Using evidenced based literature to create the leaflet.
3. Leaflet design alongside an illustrator and approval process by clinical governance.
4. Online survey to obtain feedback.

**Results:** Positive feedback was gained, relating to its child-friendly layout and easy-to-read format.

**Conclusion:** The use of E-leaflet has been a successful method of information sharing, in a time where face-to-face appointments were not possible and postal services were delayed. This information is easy to return to and share with others.

Families now have baseline information to aid in behavioural change that can benefit the entire household. E-leaflets are a cost-effective resource.

### **Lingual Frenotomy in the Treatment of Ankyloglossia in the Baby: Case Report**

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**Introduction:** The lingual frenum is a mucous membrane located in the sublingual region. Sometimes this structure is very short and / or thick, limiting the movements of the tongue. This condition is called ankyloglossia and can negatively affect the development of the child. Therefore, early diagnosis plays an important role in this condition, as it is directly related to the success of treatment.

**Case report:** A male baby, 6 months old, presented with difficulties in breastfeeding. After medical history and clinical examination, the patient was diagnosed with ankyloglossia, which interfered with normal tongue movements. Frenotomy was adopted as a therapeutic approach. The improvement in tongue mobility can already be noticed in the immediate post-surgical period.

**Discussion:** It is known that changes in the tongue can compromise oral functions. In the case presented, ankyloglossia resulted in difficulty of the patient's breastfeeding, as it compromised the sucking and swallowing movements. There is no consensus in the literature on the ideal age for surgery. To avoid damage of the development of the infant, the diagnosis must be early, and the surgery performed as soon as possible, aiming at the optimization of breastfeeding for the child's full development, giving more comfort to the baby and mother.

**Conclusion:** Ankyloglossia is an easily diagnosed deformity in routine examinations of the oral cavity. Frenotomy is an effective surgical intervention for the treatment of the anomaly, being the most often used technique for babies and children and its results can be seen right after the surgery.

### **Compare the Effectiveness of Topical Anesthetic Gel and Acupressure Points as a Pre Injection Anesthetic Technique in Pediatric Dental Patients**

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**Background:** Adequate Pain management is mandatory for effective treatment in pediatric patients. There are several pharmacological and non-pharmacological pre injection anesthetic technique of which Lignocaine hydrochloride 2% gel is the most commonly used. Recently Acupressure has been proven to alleviate pain associated with needle prick. The aim of the present study is to compare the effectiveness of topical anesthetic gel and acupressure points as pre injection anesthetic techniques in pediatric dental patients.

**Methods:** After obtaining ethical clearance from institutional review board (SRMU/M&HS/SRMDC/2020/PG/002). Sixty patients aged 6-8 years were recruited for study and randomly divided into three groups of 20 each. Group I patients received topical anesthetic gel (2% lignocaine hydrochloride) as pre injection anesthetic. For Group II patients Acupressure beads were placed in Shenmen, Xiaguan, Yingtang(extra one) points for 30mins as pre injection anesthetic. Group III patients received both Acupressure and topical anesthetic gel . Videos were recorded during the procedure and were evaluated using FLACC pain scale by the trained individual blinded from the study. The data was subjected to statistical analysis.

**Results:** Group III showed least FLACC scores and is statistically significant ( $p < 0.05$ ). When comparing Group I and Group II FLACC scores were not found to be statistically significant ( $p = 0.38$ ).

**Conclusions:** This study demonstrates that Acupressure is equally as effective as topical anesthetic gel. Acupressure and topical anesthetic gel showed maximum reduction in FLACC scores. Therefore, Acupressure as an adjuvant with topical anesthetic gel is effective for pain management in treating pediatric patients.

**Amelioration: A Novel and Pioneer, Cognition Based Behaviour Management Strategy**

DHANYA K B

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**Background:** To evaluate whether the psychological features explained by Piaget six decades ago for child of preoperational stage are still valid in present generation of children and then to apply these features for behavior modification as new behaviour management strategy: Amelioration.

**Methods:** A cross-sectional study with 200 subjects divided into four groups on the basis of age from 4-7. Manifestation of preoperational feature was assessed by 3 experiments, policeman doll test, coin test and beaker experiment. Depending on most pronounced feature, behaviour management strategy based on the categorized method and cognitive development of the child was used for framing a better foundation and cooperation in the child and used Frankl's behaviour scale and was statistically analysed.

**Results:** 94% children showed egocentrism and centration at age four which reduced eventually as the child grew from age 4 to 7 and reduction of these features as age increases were seen which in-contrast to the finding of Piaget, which was put forth 6 decades ago. Clinical application of these cognition based behaviour management strategy made the patient accept the treatment well and gave better patient cooperation and study was statistically significant at p0.001.

**Conclusion:** Cognitive features mainly egocentrism and centration were still valid in children of present generation and cognitive feature based behaviour modification techniques named as Amelioration is the best method for eliciting cooperative response from child and it can be considered as a novel and pioneer behaviour management strategy for better patient cooperation.

**“Magic in Dentistry: Bag of Pedia – Tricks”**

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**Background:** Lack of cooperative behaviour faced by pediatric dentist is most typically attributed to behavioural manifestations of anxiety and the relationships which are long-established, deterministic, and that form part of the aforementioned belief system of the child. Forehead and Land in their study found that most uncooperative behavior of the child is due to their strong will and they generally will be confident, persistent and independent. A fruitful method to deal with these strong willed children is to violate the causal relationship by some magic tricks starting from preventive via curative to his/her post-operative follow ups visits

**Literature Review:** Tricks can be applied at 3 levels of their visit. Level 1 is Preoperative tricks which includes the Preventive measures, that teach and educate child for good oral health. Level 2 is operative tricks which involves child preparedness and successful real procedure. Level 3 is postoperative tricks which involves the positive reinforcement for regular follow ups.

**Conclusions:** The purpose of this poster is to make pediatric dentist to think like magician by using the science behind the magic and applying it in their practice for creating a positive attitude of a child towards dentistry and better procedural experience. There is saying by Jack Delvin, president of the magic circle, “The door to magic is closed, but it’s not locked. According to Stephen et al it means that there are no real secrets in magic; it’s all there for everybody to discover and execute. The similar concept can be applied in pediatric dentistry where all science is known but we have to discover the way in which child perceives it at best.

### An Affirmative Influence of Oral Health Promoting Schools

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**Background:** To evaluate effectiveness of School Dental Health Education Programme on Oral health status of students through Teacher's Training Programme (TTP).

**Methods:** A 4 phased Teacher's Training Programme was conducted at Government School, Davangere, Karnataka, India.

PHASE 1: Focused upon tutors' training on Oral hygiene measures, through demonstration session, utilizing educative tools such as lectures, models and Audio-visual aids i.e., power point presentations.

PHASE 2: 100 students within age group 8-11 years were selected for the study. Simplified Oral Hygiene Index of selected students was recorded.

PHASE 3:

- Students were reinforced about oral health measures and practices by trained tutors.
- 10 students were randomly chosen to demonstrate the same, followed by an activity - based learning in the form of quiz.

PHASE 4: A month later, follow-up was conducted. OHI-S INDEX was recorded again. Student who maintained excellent oral Hygiene was awarded as "School Dental Star"

**Results:** Evaluation of practical aspects through Mean Simplified Oral Hygiene Score. (OHI-S).

Overall mean OHI-S before Teacher's Training Programme: 3.2

Overall mean OHI-S after Teacher's Training Programme: 1.15

Statistically significant difference, with a positive correlation between impact of Teacher's Training Programme and practical aspects of Oral Hygiene measures is 2.05.

Student maintaining excellent oral hygiene awarded as "School Dental Star".

**Conclusions:**

This study provides a footprint on Teachers' Training Programme as an aid in advancement of School Dental Health Education Programme.

### **Comparative Evaluation of Newer Behaviour Management Modality with Traditional One among 4-9 years of Patients**

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**Background:** Behaviour guidance is a technique used to subdue inappropriate behaviour by establishing communication that meets the needs of a child. This study aimed to measure the effectiveness of a Play model compared to the Audio-Visual behaviour management aids in managing anxious children.

**Methods:** Fifty children within the age group of 4-9 years, were divided into 2 groups: either the Play model or the Audio-Visual behaviour management aids. During the first visit no behaviour management aids were used and in second appointment the aids allotted to that group were used. Hemodynamic parameters like pulse rate & blood pressure were recorded pre-operatively and post-operatively along with use of visual analogue scale post operatively to analyse the anxiety during both the visits.

**Results:** The average pulse rate & blood pressure scores were lower among children who received Audio-Visual behaviour management aids when compared to those who received Play model intervention. The anxiety scoring was also seen to reduce post intervention in both the groups.

**Conclusions:** Appropriate use of management techniques can improve the child`s behaviour in subsequent dental visits. Educating the child prior to a dental procedure using conventional audio-visual modes along with incorporation of dental play model can significantly alleviate his/her anxiety and engage the child in dental treatment.



**Three Way Analysis of Pain in Pedodontics Through Perspective of the Children, Adolescent and Dentist**

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**Background:** A paediatric dental patient is especially vulnerable to handle during childhood and adolescence, by physically and mentally, as compared to adults. This study was conducted to analyse children's and adolescents' behaviour towards dental treatment and adventures of general, articulate and dental analysis affliction and to accretion acumen into the ability and attitudes of dentists appear affliction management.

**Method:** The Present study recorded 40 items CPI response of 8-19 years old 390 subjects. Most frequently accomplished CPI affliction situations were analysed by Exploratory Agency Analysis to abate the breadth of the questionnaire. 190 paediatric and adolescent dental patients (12-18-year-olds) and their parents were advised for DDQ. 390 dentists were evaluated for their ability of affliction administration and attitude. Procedures such as dental injection, tooth drilling and tooth extraction found to be painful by 50% of the subjects.

**Results:** The affliction acuteness acquaintance was assorted by accepting college dental anxiety, a disability, age beneath

**Conclusion:** Such patients must be given added affliction and additionally affliction abatement during invasive dental treatments. All children must be provided best pain free dental management.

### Why Fear when Dr. Chuckles is Here!

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**Background:** The mere sight of a conventional syringe during delivery of local anesthesia may provoke fear and anxiety in children leading to un-co-operative behavior. There is a requirement to make this procedure comfortable for the child patient. In this study we compared the pain perception of different local anesthesia delivery systems – The Wand, Self-aspirating Syringe, Insulin Syringe and conventional syringe. An innovative syringe camouflage sleeve was designed and named Dr. Chuckles. We evaluated the acceptance of two least pain causing systems with and without camouflage.

**Methods:** The study had two parts: part 1: evaluation of pain perception of the different local anaesthetic delivery systems and part 2: evaluation of acceptance of two least pain causing systems with and without camouflage. A total of 80 participants were divided into - The Wand, Self-aspirating Syringe, Insulin Syringe and conventional syringe groups. Pain perception on injection was noted in each group using Wong Bakers Facial Pain Rating Scale. The two least pain causing systems were then evaluated for acceptance in children with and without the use of Dr. Chuckles. All the statistical operations were done using SPSS Version 23.0 statistical package.

**Results:** The patients receiving the Wand system and insulin syringe reported significantly less pain on needle insertion. Those children receiving local anesthesia using the newly designed sleeve showed significantly reduced amount of pain, fear and anxiety.

**Conclusions:** This innovative camouflaged local anesthesia delivery system, Dr. Chuckles, reduced the fear and anxiety associated with dental injections and significantly improved behavior in children.

### Parenting Styles and Child`s Dental Behavior: A Correlation

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**Background:** Behavior management problem is widely agreed to be a key factor in the care of children in dentistry. If a child`s behavior in the dental surgery/office cannot be managed then it is difficult if not impossible to carry out any dental care that is needed. For these reasons, several studies have been put forward explaining the behavior of a child and various factors influencing it. Further, amongst all the factors, it has been well-documented that parenting style strongly correlates with child`s behavior in the dental clinic.

**Literature review:** Parenting style is conceptualized as a constellation of attitudes or a pattern of parental authority towards the child which are conveyed to the child, creating the emotional context for the expression of parent behavior. It reflects the ways in which parent discipline their children. This in turn may have influence on the dental behavior of the patient. Further, evolving parenting styles and parental behaviors influenced by economic hardship, changes in societal norms, working parents, hectic lifestyles have left practitioners challenged by an increasing number of children ill-equipped with the coping skills and self-discipline necessary to contend with new experiences.

**Conclusion:** If dentists are able to identify the parenting style, it possibly will not only just help with a proper understanding of the child and the situation better in the dental clinic but will also enable the dentist to impart care to the child with the highest possible standards.

### **Influence of Parent-Provided Distraction (PPD) and Interactive Distraction (ID) with a Handheld Video Game (HVG) on the Child'S Responses during Local Anaesthesia Administration**

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**Background:** To evaluate the influence of parent-provided distraction (PPD) and interactive distraction (ID) with a handheld video game (HVG) on the child`s responses to local anesthesia (LA) administration for dental treatment.

**Methods:** After obtaining the due ethical clearance, Children attending the department of pediatric dentistry were randomly selected and distributed to the two groups (PPD and an ID with HVG). Parents present in the operatory and tell-show-do (TSD) technique remained common in both groups. Behavioral, physiological, and self-report measures of pain were estimated using the FLACC scale, pulse rate as well as Iowa pain thermometer-revised scale and compared for both groups correspondingly. The SPSS (standard statistical package) version 17.0 (SPSS Inc., Chicago, USA) was used for statistical analysis at the significance of  $p \leq 0.05$ .

**Results:** A total of 30 children (15 in each group) aged 7-11 years have participated in the study. There were no significant differences observed among both genders ( $p > 0.05$ ). The independent t-test for the pulse rate showed no significant difference between the two groups ( $p > 0.05$ ). Paired t-test for pulse rate in the PPD group showed a significant difference compared to ID with the HVG group ( $p > 0.05$ ). The scores for FLACC and ID with HVG, showed a statistically significant decrease in scores recorded for ID with HVG, whereas the scores recorded for FLACC did not show any statistically significant difference.

**Conclusion:** Based on this study results, PPD would be the least distressful option, compared to the ID with HVG in children while administrating LA.

**“Conquering Fear, Building Trust” – Never Let Child Depart in Tears**

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**Background:** Behavior modification is a very important part of pediatric dentistry. No dental treatment can be rendered effectively if the child is not cooperative enough to go through the treatment procedure. In case of an uncooperative child, it is utmost necessary to identify why the child is uncooperative and then set out a strategy of psychological management and empathy to enable the child to cope with the situation and come to accept dentistry as a part of life.

**Literature review:** The overall goal is that the dentist is able to provide high quality, safe dental care in an environment that is as pleasant as possible for the child. The optimal outcome for the child should be a positive attitude towards oral health care. Role of society and the attitude of parents towards dentistry is also important in managing a child.

**Conclusions:** Altogether our poster will give a pictorial presentation of factors related to taming of a child in dental office

## Hypnosis For The Management Of Gag Reflex In Orthodontic Treatment : A Case Report

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**Introduction:** Gag reflex is a common problem dentist have to deal with and it can complicate the treatment which needs to be carried out. Some cases can be handled by using simple distraction techniques such as getting the patients to lift their legs as per instructed while the operator is carrying out the treatment.

**Case Report:** The patient is a 13-year old male who was referred for the management of an anterior crossbite involving the central incisors. Management of the crossbite using an upper removable appliance was planned but the operator was unable to get an impression of the patient's dentition without which an appliance could not be constructed. There was also the issue of how the patient would tolerate the appliance later on. Hypnosis was carried out for the patient during impression taking and fitting of the appliance. The patient was also taught self-hypnosis to enable him to continue wearing the appliance throughout the treatment phase. He has successfully been wearing the appliances.

**Discussion:** As all other methods failed, hypnosis was introduced as a method to overcome the patient's severe gag reflex. The technique proved to be successful and the patient is able to continue with his orthodontic treatment as planned. Surprisingly, the mother of the patient also reported that the he is able to swallow his oral medications after the hypnosis session. The ability to swallow medication was a positive secondary outcome of the hypnosis therapy.

**Conclusion:** Hypnosis can be used to overcome gag reflex in orthodontic treatment with emphasis on impression taking and the use of intra-oral appliances.

### **Comparison of Patient Cooperation during Corrective Orthodontic Treatment between Patients with and without Prior Interceptive Orthodontic Treatment**

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**Background:** Cooperation is a fundamental factor in achieving clinical success of orthodontic treatment and can be influenced by multiple factors such as the professional-patient relationship, the relationship with their parents, the motivation and the duration of the treatment. The purpose of this study was to evaluate differences in cooperation of adolescent patients subjected to orthodontic treatment between those who had received prior interceptive orthodontic treatment with those who did not.

**Methods:** A prospective observational analytical cohort study was carried out. A sample of 132 patients who received orthodontic treatment between 10 and 17 years of age treated at the CES University Orthodontic Postgraduate Clinics and in 9 private practices in Medellín Colombia was selected; patients were divided in two groups of 66 patients; one that had received previous interceptive treatment and another that only received corrective treatment. Cooperation was assessed through the Orthodontic Patient Cooperation Scale (OPCS) at four moments during the first year of treatment (three, six nine and twelve months).

**Results:** An estimation of cooperation revealed that there was a significantly greater cooperation ( $M = 4.6$ ) in patients who had received early treatment compared to those who only had corrective treatment ( $M = 2.3$ ).

**Conclusions:** Patient cooperation during orthodontic treatment was higher in patients who had received early orthodontic treatment when compared with those who had not received previous treatment.

## **Determinants of Pain in Epidemiological Approach and Different Methods to Manage it among Children: A Literature Review**

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**Background:** Pain experience in childhood may shape future pain experiences in adulthood. Since pain has sensory, cognitive, emotional and behavioral components which are interrelated with other co-factors (a complex multidimensional concept). The pain related determinants in epidemiological approach can be listed as emotional, environmental and cognitive determinants. Emotional determinants can be anxiety, anger, depression, positive emotions, etc.; environmental determinants can be virtual and virtual reality, waiting and play area, ambience of clinic, environment in family and school, etc.; and cognitive determinants can be attention, expectancy, appraisal, past experience, etc. Hence, the purpose of review was to combine determinants of pain in epidemiological approach and different methods to manage it among children.

**Literature review:** The randomized controlled trial conducted by Dixit UB et. al. among 4-6 years old children and concluded that the music therapy and Bach flower therapy were showed significant effect on reduction of dental anxiety. In another study done by Fux-Noy A et. al. concluded that a sensory adopted waiting room environment was be less important in reducing children's anxiety prior to dental treatment, however it can be reduced by decreasing waiting time. A study conducted by Cademartori MG et. al. concluded that even if the familiarization of child with the dental environment, maternal dental anxiety, dental pain in the previous month, the complexity of dental treatment was negatively affecting the children's behavior.

**Conclusion:** The determinants of pain can be managed by combining different techniques with respect the individual child.



### Parents` and Caregivers` Expectations in a Private Setting: A Qualitative Survey

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**Background:** In paedodontics, adherence to treatment depends upon the tripod dentist-patient-parents. Even though subjective factors such as confidence, communication and affection are key for building trust and true bonds among all, other much fewer known factors may interfere and jeopardize the dentist-patient relationship. Some studies addressed these questions in academic facilities, but very few overlooked private offices, which is the reality of most dentists in Brazil.

**Methods:** A questionnaire was developed through an electronic platform and distributed to an unselected list of parents and caregivers at our private office, in Brasília, Brazil. The survey comprised qualitative questions and was designed for parents and caregivers regarding their perception on most valued aspects of a consultation, but also about their children`s` behaviour, their perception on dentist`s` professional knowledge and even convenience aspects of the venue itself.

**Results:** A bit more than one-third of all questionnaires sent were answered, mostly by mothers of children from 6 to 12 years-old. Flexible timetable schedule and parking facilities were the most frequently valued aspects of the business itself. Most responders cited that it was important for their kids to be always attended by the same professional and that it was more important that they felt welcomed rather than not crying during the consultation.

**Conclusions:** Assessing parents` and caregivers` expectations seems to be a simple and valuable tool for shaping best practices in a private paedodontics office.

## Mindfulness-Based Interventions and Compassion in Pediatric Dentistry

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**Background:** Mindfulness is defined as “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment. Compassion originates as an empathic response and can be defined as the sensitivity shown to understand another person’s sadness or worries combined with a willingness to help.

**Literature Review:** In almost all disciplines of medicine the main goal is to promote the wellbeing of people; therefore showing empathy and compassion should be considered as ways of providing a healthy connection in healthcare professionals’ daily work.

Dental operations are mostly stressful procedures according to the patient’s point of view. By that means empathy and compassion shown by the dental professional becomes crucial. Successful behavior management is the key to successful dental treatment in Pediatric Dentistry. Especially children who have suffered undergoing dental treatment may have emotional trauma from dentistry that needs healing. Cultivating “mindfulness” into clinical dental practice is thought to be an exciting opportunity that every dental professional can develop to enhance patient positive experience and professional satisfaction.

**Conclusions:** Based on a selective review of the medical literature, we suggest that mindfulness practice should help improve attentiveness, self-awareness, acceptance, wisdom, and self-care in dentistry. Besides, the potential role or benefits of mindfulness-based interventions and compassion needs to be explored in everyday dental practice.

**Behaviour Guidance in the Times of COVID- 19 Pandemic**

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**Background:** Dental appointment is a stressful situation, raising children's anxiety level and avoidance behaviour. This makes a first dental visit crucial in the formation of a child's attitude towards dentistry and future treatment success. COVID-19 pandemic has challenged the existing healthcare systems across the globe due to its mode of transmission, exposing both patient and dentist at risk of transmission. Lack of face-to-face communication, change in dentist's attire due to personal protective equipment worn, may lead to apprehension of paediatric patients and impose a challenge in implementing behaviour guidance, to the paediatric dentist.

**Literature Review:** During COVID-19 pandemic, tele-dentistry utilizing video-conferencing technologies, mobile photography has been preferred to diagnose and treat dental problems as it limits human contact whilst providing real-time consultations. Positive pre-visit pre-imagery, live or audio-visual modelling and tell-show-do are some of the basic behaviour guidance techniques that are known to reduce fear and anxiety among child patients leading to better patient cooperation. Further use of dental apps in which children virtually act as dentists have proven to instil pragmatic attitude towards creating a pre-appointment positive imagery of dentistry. However, concerns on confidentiality, language barrier, limited internet and smartphone access has limited its benefits from being used to its complete potential.

**Conclusion:** Necessity is the mother of inventions and with the current pandemic situation, paediatric dentist can continue to provide quality care with minimum contact innovatively through amalgamation of tele-dentistry and mHealth with conventional methods of behaviour guidance, keeping in mind the barriers to its use.

### **Use of Structural Equation Modeling in Assessing the Relationship of Child Behavior and its Evaluation during the First Dental Visit**

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**Background:** The first dental visit always creates an intense emotional response in a young child. Assessment of an anxious child's dental behavior often poses a challenge to the clinician. Bodily expressions of a child can give an insight towards behavioral evaluation.

**Methods:** Each child of the study population (20 children, 3 to 6 years), during their first visit to the dental setting was subjected to a sequence of events handled in a strictly structured way by the same dental team, and videos were recorded without the child's knowledge. Each of the child's behavior was assessed from the video recordings using Frankl Behavior Rating Scale and modified Behavior Evaluation Scale (BES) by Kurosu, to explore the relationship between behavior exhibited by the child and its evaluation.

**Results:** Factor analysis was done initially, and three behavior types such as escape, self-defence and facial expressions were extracted. The structural equation modeling (SEM) was implemented to investigate the correlation between the 3 latent variables constructed by BES and their contribution to the Frankl Behavior Rating Scale. The correlation was represented by a path diagram which indicated that facial expression had the strongest correlation to the Frankl behavior rating Scale.

**Conclusion:** Observation of three main latent variables for the behavior of the children: escape, self- defense and facial expression indicated in this explorative study may be useful for the clinician in assessing child's behaviour during the first dental visit. However, further studies are needed to confirm this model with children of different ages, using larger sample size.

### Use of Technologies for Distraction in a University Clinic of Pediatric Dentistry

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**Background:** To compare the effect of audiovisual distraction techniques with conventional management techniques in relation to behavior, anxiety/fear and pain perception in children during dental care. In addition, the operator's stress level during the procedure and his assessment of the use of the techniques were evaluated.

**Methods:** This randomized controlled clinical study was carried out from August to December/2019, with 48 children aged 6 to 10 years, with good general health and the need for curative treatment. The sample was randomized into (1) control group, which received care conventional, (2) audiovisual eyeglasses (AVE) group, and (3) tablet group. Anxiety was verified with the Venham figure test and heart rates, behavior was assessed by the Venham scale and pain perception by FLACC and FPS-R, in all groups. The perception of the child and the operator about the use of distraction was also assessed, as well as stress (CSS and VAS). The groups were compared using chi-square and t-tests ( $P \leq 0.05$ ).

**Results:** Children in the AVE group presented higher frequency of collaborative behavior, but anxiety / fear and pain perception were similar. The acceptability of children to distraction was 93% and that of operators, 96.7%.

**Conclusion:** The use of distraction may help behavior management during care, in addition to being easy to use and having good acceptability. AVE and tablets can be useful tools to aid dentists in the dental treatment of children.

**Adapt - Modify - Execute: Revamping the Behavior Shaping Methods, this Pandemic**

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**Background:** Viral infections are not uncommon in the world. In 2019, a virus from the coronaviridae family SARS COV 2 rattled the world health systems with a novel coronavirus respiratory infection. Consequence of Pandemic has affected children and adolescents emotionally with behavior changes due to fear and anxiety. Dental treatment by itself is anxiety provoking in certain children; the perils of the ongoing pandemic only serve to make this more challenging. This demands timely responsibility for the Pediatric dentists to adapt certain modifications in conventional behavior shaping techniques to meet the protocols of the new guidelines and also to address the behavioral shaping needs of the patient.

**Literature review:**

1. A publication by Wen Yan Jiao, et al., 2020 has explained psychological distress in the article, Behavioral and Emotional Disorders in Children during the COVID-19 epidemic, concludes that there is increased emotional needs among children and adolescents.
2. M. Al-Halabi, et al., in June 2020 expressed his opinion on added anxiety that the child might have as a result of the dental healthcare providers having to follow enhanced PPE protocols in the article titled Assessment of pediatric dental guidelines and caries management alternatives in the post COVID-19 period, a critical review and clinical recommendations.

**Conclusion:** Change is something very constant in Pediatric dentistry for the efficient and effective treatment delivery especially during this Pandemic. Managing the pediatric patients effectively and efficiently during the pandemic can be done by understanding and addressing their dental and emotional needs.

### Dental Anxiety among Dental students at the University of Nairobi Dental School, Kenya

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**Background:** Dental phobia is an irrational fear of dental treatment with a worldwide prevalence of 3-43%. Dental students in training are not exempt. This can be transmissible from the student to the patient during treatment. The aim of this study was to investigate dental anxiety among University of Nairobi dental students.

**Methods:** 73 dental students who gave informed consent and fit the inclusion criteria were interviewed using self-administered questionnaires. Dental anxiety was measured using the Modified Dental Anxiety Scale.

**Results:** The age distribution ranged between 18-20years 13(17.8%), 21-23years 37(50.7%) and 24-26years 23(21.7%) of whom 30(41.1%) were male, 43(58.9%) were female. Prevalence of high dental anxiety was 30%. 13(30%) and 9(30.2%) females and males respectively had high levels of anxiety. Majority, 63(86.3%) had been to a dentist before. 32(50.8%) had missed a dental appointment with 10(31.2%) having high levels of anxiety. 42(57.5%) participants had existing dental problems, 11(26.2%) having high anxiety. 31(42.5%) students fear the dentist with 15(48.4%) reporting high levels of anxiety. The main reason for motivating the students to visit a dentist was pending appointments 27(58.7%) and pain 17(37%).

**Conclusion:** The prevalence of dental anxiety was 30% with no relationship between level of anxiety and age or gender. There was a positive relationship between dental anxiety and self-perception of the fear. Most students had existing dental problems not sought treatment for with most reporting irregular dental visits. Majority cited pain as motivation to seek treatment suggesting that treatment is only sought in the emergency stages of the disease.

## **An Assessment of the Behavior Management Techniques used on Paediatric Dental Patients by Selected Dentists in Nairobi**

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**Background:** Behavior management involves the use of techniques to successfully manage anxious and fearful patients. With better understanding about these behavior management techniques (BMTs), the level of dental anxiety in paediatric patients can be greatly reduced. The purpose of this study was to assess the BMTs used by dentists in Nairobi, Kenya.

**Methods:** 73 dentists were questioned on their use of BMTs. Data was collected using a questionnaire and was analyzed using computer software (SPSS).

**Results:** Age distribution ranged from 20-30 years 27 (37.0%), 30-40 years 23 (31.5%), 40-50 years 19 (26.0%) and 50-60 years 4 (5.5%). 41(56.2%) were males and 32 (43.8 %) were females. 39 (53.4%) were in private practice and 34 (46.6%) were in public practice. 53 (72.6%) had a BDS degree and 20 (27.4%) had an MDS degree. 60 (82.2%) were aware of universal guidelines on behavior guidance. 41(56.2%) preferred a combination of non-pharmacological and pharmacological techniques. 69 (94.5%) used Tell-Show-Do. 60 (82.2%) used distraction and 55 (75.4%) reported audio-visual as an effective BMT. Positive reinforcement was used by 65 (89%) and 60 (82.2%) used euphemisms. 37 (50.7%) allowed parents in the clinic. 50 (68.5%) reported not to use hand-over-mouth and 45 (61.6%) used voice control. 34 (46.6%) used protective stabilization. 53 (72.6%) used sedation and Nitrous Oxide was the most used sedative, 39 (53.4%). 20 (27.4%) reported the use of General Anesthesia.

**Conclusion:** The commonly used BMTs were Tell-show-do, positive reinforcement and distraction. Hand-over-mouth and protective stabilization were still used by some dentists. Pharmacological techniques were not commonly used by dentists in Nairobi.



**Gender Influence of Adolescent Oral Health Educational Interventions: Randomized Clinical Trial**

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**Background:** This study analyzed the gender differences in the association between health educational methods and the standard of hygiene and periodontal health of adolescents.

**Methods:** Longitudinal research involving 288 teenagers from a public school in Curitiba, Paraná. The average age was 16.05 (SD=1.21), being 157 (54.5%) female. Video (n=141) and oral orientation were used at random, standardized (n=147), addressing periodontal diseases and their forms of prevention. Hygiene indexes, simplified oral plaque (IHO-S) and gum bleeding index (ISG) were assessed by a calibrated examiner twice: before and 30 days after the educational interventions. Tests were used for statistical analysis ( $\alpha=0.05$ ).

**Results:** There was a significant decrease for IHO-S and ISG between the two moments in both genders ( $p<0.05$ ). Girls presented lower plate index ( $P=0.012$ ) and gingival bleeding ( $P=0.015$ ) before the interventions than boys. After the interventions, there was no difference in IHO-S between genders ( $P=0.494$ ), however boys remained with higher ISG ( $P=0.041$ ) than girls. As for the interventions, boys who watched the video showed higher IHO-S ( $P=0.004$ ), but lower ISG ( $P=0.014$ ) than those who received standardized oral guidance.

**Conclusion:** It can be concluded that although the educational interventions have had a positive impact on the levels of hygiene and periodontal health in both groups, there were differences according to gender, being that the girls did better.

**Acupressure: The Health Rover!**

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**Background:** Acupressure is a non-invasive variant of acupuncture and is known to reduce dental anxiety.

**Literature review:** The presence of anxiety, fear and phobia are associated with a rise in blood pressure and pulse rate. There are pharmacological and non-pharmacological methods to reduce anxiety. The most commonly-used are the non-pharmacological methods. Acupuncture has been applied in dentistry for a number of purposes: mainly dental anxiety, pain relief, gag-reflex treatment, temporo-mandibular joint disorders and post-operative pain relief. Acupuncture is a branch of ancient Chinese medicine. It is based on the concept of "Qi" which means energy flow. This procedure has already proven its effectiveness in anxiety disorders. The major complication with this treatment modality is the bacterial infections caused by reusable needles. Acupressure uses the same principle of acupuncture, except the use of needles, and is appropriate for children. The acupoints in the body are stimulated by using a variety of tools like derma-rollers and magnetic-point stimulators. Acupressure has also been demonstrated to be effective in reducing nausea and vomiting in strabismus surgery and spinal anesthesia. Acupressure does not require extensive training, in contrast to acupuncture. Acupressure can easily be taught to children and parents if used as a self-care measure. Simplicity, non-invasiveness, ease in performance and lack of pain are the major features that makes acupressure well tolerated by children

**Conclusion:** Acupressure can be a viable alternative to reduce dental anxiety in children undergoing scaling and restorative procedures.

**The Perception of Oncological Patients` Parents about Behavioral Techniques used in Pediatric Dentistry**

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**Background:** This study aims to evaluate parents` perceptions regarding the techniques used for the behavioral management of child cancer patients.

**Methods:** A study was carried out with the parents of cancer patients treated at the Dental Service of the Support Group for Children with Cancer. It was an audiovisual exhibition of the different research techniques made for the child`s parents. Answers were recorded in two questionnaires that focused on the same content. In the first round, only videos about the techniques were broadcasted, and after this, prior explanation was given about how the methods were carried out in addition to an audiovisual exhibition.

**Results:** After clarifying the techniques used, it was found that active contention showed a significant difference when the respondent`s gender was evaluated. Regarding schooling, there was no significant difference before and after the explanation of the techniques. Regarding the agreement between the use of management techniques before and after the explanation of them they all presented a percentage of gross agreement above 70%, demonstrating reliability. In relation to the Kappa test, only Tell-show-do and presence of parents showed moderate agreement. It can also be observed that there was a statistically significant difference between almost all techniques except positive reinforcement.

**Conclusion:** It was observed that for behavior techniques to be effective in children, the best thing to do is to clarify it for those responsible prior to their use, since there is still a lack of knowledge on their part about the procedures.

### Waiting Room as an Auxiliary Method of Child Behavior Management

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**Background:** The dental or hospitals waiting rooms should work as a way of socializing between professionals and patients for activities development in education and health, and child behavior management be it playful or humanized method. Thus, the aim of the present study was to review the literature about the importance of using the waiting room as an auxiliary method of handling children`s behavior, aiming at reducing the anxiety and stress of patients and their parents.

**Literature Review:** The studies were searched in the PubMed and Scielo databases. The survey starts in March 2018 to December 2019 and the keywords used were behavior management, waiting, children, pediatric dentistry. The review addressed the main aspects of the emotional and cognitive children`s development, the factors that can influence this emotional development, aspects related to medical and dental appointments and the relationship with the places of dental care, factors related to waiting time for the appointment and strategies used in a waiting room to assist in the management of child behavior.

**Conclusions:** It was concluded that waiting time is the biggest contributing factor to the child`s behavior in the appointment, as much for the children as for their parents. Thus, creating a waiting room space with a ludic environment will help health professionals in decreasing anxiety and stress, resulting in children being happier and more cooperative.

## **Comparative Evaluation of Magic Tricks Versus Audiovisuals as a Behavior Guidance Technique for Anxiety Reduction in Children: An Observational Study**

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**Background:** Anxiety leads to uncooperative behavior in children. Aversive and pharmacological behavior guidance techniques are may not be acceptable to parents. Non-aversive techniques like distraction, are used to modify a child's discomfort by disrupting the child's attention from the main task.. Audio-visual method based on distraction principle has helped to reducing the anxiety and achieve cooperation in uncooperative children during their dental visit. Also, previous literature discusses use of magic tricks to reduce anxiety in children. Thus, the study was planned to evaluate and compare the effectiveness of magic trick and audiovisual behavior guidance techniques to reduce anxiety in a group of 4-11 years old un-cooperative children during dental treatment.

**Methods:** The study comprised of 100 4-11-year-old children with Frankel behavior rating II & III. On the first visit, random allocation was done into 2 groups and oral prophylaxis was undertaken without any behavior guidance technique. During the second visit, these children were subjected to the behavior guidance aid according to the allocated group and operative procedures were undertaken. Hemodynamic anxiety parameters along with anxiety scale were recorded on both the visits.

**Results:** Significant mean reduction in anxiety was seen with both groups.

**Conclusion:** Magic tricks, a revisited behavior guidance aid in medical literature has proved to be equally effective to audiovisual aid for anxiety reduction in children during dental treatment.

**Chair Side General Anaesthesia: A Boon to Pediatric Dentist**

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**Introduction:** Behavior management plays a major role in success of dental treatment in pediatric patients. In routine dental practice we encounter children with varieties of behavioral problems. Some children may not cooperate as they are too young and some may have certain medical conditions which prevent them from obtaining dental treatment. Even though non-pharmacological means of behavior management has proved to be effective tool in managing the uncooperative children, its use is limited in medically compromised children. Dental sedation and general anesthesia are the treatment options in such cases.

**Case reports:** This paper describes two cases of early childhood caries which were treated under general anesthesia due to their high non-cooperative chair side behavior. In both cases it was definitely negative behavior according to Frankel's rating scale. Complete oral rehabilitation was done which included restorations, fluoride application and extraction of grossly decayed teeth that had a poor prognosis. Ten days after procedure both children were recalled and oral hygiene status was assessed. Removable functional space maintainers were given and oral hygiene instructions were reinforced

**Discussion:** Careful selection of cases is out most important for success of general anesthesia cases. We need to work in collaboration with pediatrics and anesthesia personnel to get clearance for the treatment to avoid any untoward complications.

**Conclusion:** General anesthesia is a safe mode of treatment for disabled children who require emergency dental care.

## Managing a Fearful Child in the Dental Operatory

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**Background:** The greatest challenge faced by a dentist while treating a pediatric patient is uncooperative behavior due to anxiety or fear. Behavior management is widely agreed to be a key factor in providing dental care for children. Behavior management techniques both non-pharmacological and pharmacological are used to alleviate fear and anxiety, nurture positive dental attitude and perform quality oral health care effectively and efficiently. It is imperative that any approach to behavioral management for the child dental patient must be rooted in empathy and a concern for the well-being of each child.

**Literature review:** A thorough literature search using electronic and manual method was done on different non-pharmacological techniques practiced by pediatric dentist during the past five years. This literature review focuses on contemporary non-pharmacological behavior management techniques practiced by pediatric dentists to manage fearful and anxious children. Different techniques currently practiced will be enumerated and explained in the poster.

**Conclusion:** A broad range of non-pharmacological techniques are currently practiced in managing fearful children in the dental operatory. Ideally, these techniques should not be applied in a 'cookbook' fashion, but should be integrated into a broader and more comprehensive approach to patient management.

# ***Cariology and Preventive Dentistry***



### **Inhibition of Matrix Metalloproteinase Activity via a Novel SMART Composite Versus Commercial Filling Materials**

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**Background:** Matrix metalloproteinase (MMP) is an enzyme responsible for the degradation of dentine collagen fibrils, leading to interface microleakage. We developed a new antibacterial, remineralising, self-repairing and sealing composite, SMART, that restores primary teeth painlessly. This study aimed to quantify MMP activity at the surface of demineralised dentine following sealing by SMART composite versus commercially available restorative materials.

**Methods:** 2mm thick sections of coronal dentine from sound human molars, obtained following ethical approval, were fully demineralised through 4M formic acid immersion for 48hrs. Following green fluorescent probe application (EnzCheck Collagenase Assay Kit) for 5 minutes, restorative materials were applied on one surface. Materials included SMART (Schottlander), 3M ESPE Filtek Z250, ACTIVA KIDS Bioactive compomer (+OptiBond Solo Plus adhesive) and GIC Fuji IX, according to the manufacturer's instructions. Non-restored dentine was used as control. Samples were stored in deionised water and incubated at 37°C. Following 1 or 14 days, samples (n=4) were sectioned, and the interface area imaged using Confocal Light Scanning Microscopy (CLSM). The percentage area of green fluorescence in sections 260x260µm<sup>2</sup> MMP activity was determined through ImageJ.

**Results:** SMART restoration had the least fluorescence initially (0.5%), which after 14 days almost totally disappeared. Z250 and ACTIVA results were similar after incubation at day 1 (2.5%-2.0%) and day 14 (2.0% 1.8%) respectively. MMP activity of GIC (Fuji IX) was lower than Z250 and ACTIVA on day 1; however it was significantly higher at day 14, reaching 3.5%.

**Conclusion:** Sealing of demineralized dentine by SMART composite substantially reduced MMP enzyme activity. We have shown that the novel SMART composite can be an effective option in restoring carious primary teeth.

**Leadership Fellowship Project: Prevention for Paediatric General Anaesthesia Patients**

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**Background:** A retrospective audit carried out in Luton community dental services (CDS) highlighted 49 families in which 2 or more children underwent a dental general anaesthetic (GA). Within this group 19% of children went on to have a second GA. Therefore, we must recognize the need to target preventative care in this high-risk group. The aim of this project was to investigate and review current practice and attitudes of dentists in dental hospitals and CDS regarding GA pathways and prevention through a national survey, with a view to develop and implement an effective prevention-based GA pathway for paediatric patients

**Methods:** A three-month web-based survey investigating the current GA pathways for paediatric patients and attitudes of dentists towards combining a GA pathway with preventive advice.

**Results:** There were 103 completed surveys and 63% of respondents reported not having a specific GA pathway. Preventive advice was delivered by a range of clinicians including dental nurses, OH improvement teams and undergraduates. Thirteen percent of respondents highlighted barriers to providing adequate prevention advice in this patient group including the increased pressure for service provision.

**Conclusions:** Tailored preventive advice is evidently required in this patient group. A GA pathway incorporating prevention was drafted and piloted locally following discussion with Local paediatric MCN's, oral health promotion boards and Public Health England. The key stakeholders have reviewed and further developed the pathway, including a consideration to the Covid-19 outbreak and the likely impact. The importance of collaborative care to prevent successive GA's in high caries risk families is highlighted.

**Prevalence of *Candida Albicans* and its correlation between *Streptococcus Mutans*, *Streptococcus Sanguinis* and *Lactobacilli* Levels in Children with ECC, S-ECC and Caries Free**

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**Background:** The etiopathogenesis of ECC implicates, *S.mutans* and *Lactobacilli* as the main microorganisms. Recent literature suggests a probable role of *Candida*, fungal species, a normal commensal of the oral cavity, in its etiopathogenesis. Under particular predisposing physiological or pathological conditions, *Candida* is capable of provoking pathologies via endogenous infectious mechanism. In early childhood, due to immature immune system and not fully established microflora, children are more susceptible to opportunistic microbial colonization.

This study aims to determine prevalence of *Candida albicans* and its correlation between, *Streptococcus mutans*, *Streptococcus sanguinis* and *Lactobacilli* levels in children with ECC, S-ECC and caries free.

**Methods:** 30 children below 4 years of age were divided into Caries free, ECC and S-ECC based on AAPD definition. Non-stimulated whole saliva samples were microbiologically evaluated.

**Results:** A 63.3% prevalence of *Candida albicans* (63.3%) was found; it was most in S-ECC group. Yeast was the predominant (68.4%) morphological form exhibited. The acidic potential of yeast was found to be greater than the other pathological forms. No significant relation was found between *Candida* and *Streptococcus mutans* colonization.

An inversely proportional relation was found between *Candida* colonization and *S.sanguinis* in the ECC group. A directly proportional relation was found between *Candida* colonization and *Lactobacilli* in caries free group.

**Conclusion:** The study findings suggest that *Candida albicans* was most highly prevalent in S-ECC group, and had significant association with *Lactobacilli*. This may be contributing for the rapid and widespread progression of ECC in the very young children with immature immune system.

**Antimicrobial Effects of Treatment with Silver Diamine Fluoride**

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**Background:** Protocols for silver diamine fluoride (SDF) use are being developed as research on the compound evolves, and experience is gained in different populations and protocols. This study aimed to compare the antimicrobial effect of treating dentin caries lesions with SDF of different concentrations and chlorhexidine (CHX).

**Methods:** Children aged 7 to 10 years presenting with occlusal dentin carious lesions in primary molars were selected (total of 40 teeth). The sample was randomly divided into four groups: (G1) 38% SDF + potassium iodide (KI); (G2) 30% SDF; (G3) 2% CHX; and (G4) control group. After cleaning each cavity to a point where remaining dentin was firm, a sample of dentin was collected. The cavity was then treated according to the allocation group and another dentin sample was collected. Cavities were restored with a high viscosity glass ionomer cement. Microorganisms were counted, and species from the *Streptococcus* genus were analyzed for susceptibility.

**Results:** For the overall microorganisms count, it was observed that G1 and G2 presented a statistically lower number of microorganisms after treatment in comparison to G3 and G4 ( $p < 0.05$ ). When analyzing the *Streptococcus* sp. and *Enterococcus* sp. separately, statistical reductions in the microorganisms count were observed for all groups excluding the control group ( $p < 0.05$ ). Among the species tested, *S. mutans* was less susceptible to SDF treatments compared to the other species.

**Conclusions:** Treatments with SDF were more effective in reducing microorganisms when compared to CHX. The susceptibility of *Streptococcus* to CHX was lower than that observed for SDF.

### **Clinical and Radiographic Evaluation of Tricalcium Silicate v/s Calcium Hydroxide in Dentine Depth of Primary Teeth**

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**Background:** The treatment of deep caries lesions in children is a challenge for dentists, due to the risk of pulp exposure. Indirect pulp treatment is a minimally invasive procedure where the deepest layer of affected carious dentin is left on the pulp or axial wall and can be covered with a biocompatible material to stimulate remineralization of the dentin. To evaluate clinical and radiographic behavior of primary teeth with deep caries lesions, treated with calcium hydroxide or tricalcium silicate, in deep dentin after selective removal of carious tissue.

**Methods:** Retrospective observational study in 28 patients treated in the Pediatric Dentistry Specialization Program, University of Chile, with prior informed consent. Forty-eight primary molars treated for deep caries lesions were selected, selective removal of carious tissue was performed and calcium hydroxide (Dycal ®) was applied to 33 molars and tricalcium silicate (Biodentine ®) to 15 molars in affected remaining dentine. Clinical and radiographic follow-up was at 3, 6, 18 and 24 months. Chi-square statistical test was used, p

**Results:** The clinical and radiographic success rate at 24 months follow-up for tricalcium silicate was 73.3% and for calcium hydroxide 90.9%.  $p=0.24$ , with no significant statistical difference.

**Conclusion:** According to results obtained at 24 months follow-up, calcium hydroxide and tricalcium silicate had a similar clinical and radiographic behavior in the treatment of deep caries lesions in primary molars without irreversible pulp pathology. Clinical control and long-term follow-up should be maintained in treatment of deep lesions in primary teeth due to the risk of pulp involvement.

**Total and Total Soluble Fluoride Concentration in Toothpastes for Children in Brazil**

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**Background:** Fluorine is considered the most important therapeutic substance added to toothpastes, considerably increasing the control of dental caries. The aim of this study was to determine the total (TF) and total soluble fluoride (TSF) concentration in toothpastes for children marketed in Brazil.

**Methods:** Eleven dentifrices formulated with silica (SiO<sub>2</sub>) and sodium fluoride (NaF) formulations purchased at markets and pharmacies in different Brazilian cities were evaluated: Dentifrice 1(D1) - Oral B Stages; D2 - Malvatrikids Junior; D3 - Hello Kitty; D4 - Oral-B Kids; D5 - Colgate Tandy; D6- Lilica Ripilica 2-5 years; D7- Lilica Ripilica + 6 years; D8- Malvatrikids F Infantil; D9- Tralalá; D10 - Colgate Smiles; D11- Sunstar GUM. Nominal total fluoride content informed ranged between 500 to 1100 µg/g. Two samples of each toothpaste were purchased and analyzed before the expiry date. The toothpaste samples were coded and the analysis sequence was randomized to allow masked assessment. The samples were analyzed in duplicate using an ion - specific electrode. The concentrations of total F (TF) and total soluble F (TSF) were determined (µg F/g).

**Results:** Measured TF was less than that declared by the manufacturer in all the products but without statistical significance (p0.05). The TSF in 90% of the toothpastes showed potentially bioavailable to control dental caries.

**Conclusion:** The concentrations of TF were below the reported values but without significance, the TSF of most toothpastes showed fluoride potentially bioavailable. Additional studies with a larger number of samples are suggested to obtain more data.

**Practices on the Use of Toothpaste in Children under Three Years Old Attending the Child Health Care Program in a Public Hospital in Lima-Peru 2019**

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**Background:** Early Childhood Caries (ECC) is a global health problem. The regular use of fluoride toothpaste is the most effective method for ECC control. Objective: To determine the practices on the use of fluoride toothpaste in children under three years old who attended the Child Growth and Development Program for Children at a public hospital in Lima, Peru.

**Methods:** We used a questionnaire about oral hygiene practices, applied as an interview to 502 parents/caregivers of children under three years old who attended the Child Growth and Development Program for Children at a public hospital in Lima, Peru.

**Results:** We found that 79.48% of parents/caregivers had some type of oral hygiene practices with their children, while 27.49% brushed their children`s teeth with toothpaste at least twice a day, on a daily basis. Only 19.32% of parents used a toothpaste with a 1000 ppm F every day. The amount of toothpaste most frequently used was 1/8 of the length of the brush head (45.51%). The dentist (29.91%), the doctor (21.43%) and the pharmacy staff (21.43%) were the most frequent sources of recommendation for the type of toothpaste.

**Conclusion:** Despite international and national guidelines about the correct oral hygiene practices in children, we found a great variability in the use of toothpaste in children under three years of age.

**The Treatment of Tooth Loss and Its Psychological Effect on Children: One Case Report**

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**Introduction:** Early tooth loss caused by various reasons in children can lead to various problems such as function, aesthetics and phonation as well as psychological problems. Restoring the function and aesthetics increase the living standards of children as it also helps to improve the children's self-confidence and self-esteem. Various treatment protocols are applied to treat this case. The case aim was to apply a prosthesis in 5.5 years old child with multiple teeth loss.

**Case Report:** A 5.5-year-old girl who could not chew due to multiple teeth deficiency and suffer from loss of self-confidence was referred to our clinic. After the examination, it was determined that the teeth numbered 54,53,52,51,61,62,64 in the upper jaw and the teeth numbered 74,75,84,85 in the lower jaw were lost prematurely due to caries. The impression was taken with irreversible hydrocolloid material and the prosthesis was planned. After the rehearsals and controls that lasted for about two weeks, the prosthesis was adapted in the mouth. It was observed that the patient had no problems at the 6-month follow-up.

**Discussion:** In this case, rehabilitation of many missing teeth with prosthesis has been an advantageous treatment option compared to other treatment options for ensure the lost function and self-confidence of children. The difficulty of using the prostheses of children is considered as a disadvantage of this treatment option.

**Conclusion:** Prostheses applied in multiple tooth deficiencies in children were found aesthetically and functionally successful. In addition, it has been seen that aesthetic treatments affect pediatric patients' psychology positively.



### **Silver Diamine Fluoride as a Minimally Invasive and Aerosol Free Approach in Pediatric Dentistry: An Extensive Case Series**

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**Introduction:** The current pandemic of COVID-19 warrants a repeal from conventional dentistry to an aerosol free, minimally invasive yet maximally effective clinical approach. Silver diamine fluoride (SDF) is an established modality for caries arrest in children fulfilling all the above.

**Case Report:** This extensive 25 clinical case series highlight various clinical situations in which SDF was successfully used in children between 1-12 years of age with asymptomatic carious lesions of ICDAS score 2 or more in primary & permanent teeth. Parental education and counseling through innovative parental handouts were done followed by biannual SDF application over affected lesion through a clinical decision-making tree and customized protocol for each child in this multicentric case series.

**Discussion:** Primary outcome measure was caries arrest in the form of the hard and shiny lesion with no/minimal sensitivity. The secondary outcome measure was the zombie effect which was the residual staining on other tooth surfaces and indications of substantivity. One of the very few papers highlighting the usage of SDF as extensive case series in various forms of SMART( SDF+ GIC/SSC), SDF in proximal areas using expanding floss/super floss, SDF in pit and fissures as sealants, and in MIH affected teeth which were challenging for conventional operative dentistry

**Conclusion:** SDF can be effectively & efficaciously used across for different treatment modalities in different behavior patterns and age groups of children routinely experienced in a pediatric dental office especially during these pandemic times with minimal aerosol generation.

**Prevalence of Cusp of Carabelli and its Caries Susceptibility: An Ambidirectional Cohort Study**

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**Background:** To investigate the susceptibility of Cusp of Carabelli (CoC) to caries in three- to five-year-old children.

**Methods:** Retrospective data on the prevalence of CoC, based on the Dahlberg classification, were obtained from 2,128 maxillary posterior sectional die models of 1,064 caries-free children by two calibrated examiners. Subsequently, clinical examination of the above-mentioned children was carried out by a calibrated third examiner for caries assessment of the mesiopalatal surfaces (site of CoC) of the primary maxillary second molars, using the International Caries Detection and Assessment System. Data were expressed in numbers and percentages and subjected to chi-square and logistic regression analyses.

**Results:** The prevalence of CoC was 90.6%. The incidence of caries in association with CoC was 10.5%, and this association was statistically significant (0.004), with an odds ratio of 4.7 (CI=1.73-12.91). A statistically significant association was found between positive and negative expression of CoC and caries (0.001), with an odds ratio of 7.7 (CI=2.7-21.9) in positive expression and 4.1 (CI=1.5-11.3) in negative expression.

**Conclusion:** The prevalence of CoC was high, with an increased risk for caries with a positive cusp expression. This highlights the need for a closer assessment of the mesiopalatal surfaces of primary maxillary second molars during examination.

**Practice Protocols Implemented by Pediatric Dentistry Practices in India during the COVID-19 Pandemic: A Cross-sectional Survey**

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**Background:** India has presently reported more than 4 lakh cases of COVID-19 infection. Due to an imposed nationwide lockdown by the civic administration and the high risk of COVID-19 transmission in dental settings, a large number of pediatric dental practices in India remained closed between March to June 2020. Practices have since then resumed, but there is no data available studying the altered infection control and clinical protocols of these practices in view of COVID-19 and if they are in accordance with the recommendations of international and national dental organizations.

**Methods:** An online questionnaire was mailed to all registered pediatric dentists in India. Participants were questioned regarding the protocols established in their practice for screening of patients, infection control in waiting areas and the dental operator, use of personal protective equipment (PPE) and the range of clinical procedures being performed.

**Results:** A majority of the pediatric dentists participating in the survey were conducting tele/video consultations on a regular basis in their practices. The infection control measures used in the practice included socially distanced waiting areas, use of masks by patients in waiting rooms, regular sanitization of surfaces and handles. Operatory protocols included disinfection of spittoons and water lines with sodium hypochlorite, use of air filters, strict use of PPE by all staff.

**Conclusion:** Pediatric dental practices in India have implemented a variety of recommendations by international and national dental organizations in their practice protocols in an effort to reduce the risk of transmission of COVID-19 in dental settings.

Cariology and Preventive Dentistry, Periodontal Disease in Children

### **Oil Rinsing on Total Antioxidant Capacity of Saliva in Children- A Comparative Study**

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**Background:** The changes in salivary composition, physical and chemical properties can be brought about by chemical plaque control measures. Oil rinsing or Oil pulling is an ancient procedure of gargling the mouth with certain oils. Very few studies have ascertained the health benefits of oil rinsing in comparison with commonly used chemotherapeutic agents .

**Methods:** 80 children in age group of 12 - 14 years with mild to moderate gingivitis were selected and grouped into 4 groups and advised to do chlorhexidine gargling, oil rinsing with sesame oil and virgin coconut oil, for a period of one month. Unstimulated whole saliva, was collected from these subjects and evaluated for total antioxidant capacity, at three distinct time interval – at baseline , at 15th day and 30th day. The data were tabulated and statistical analysis were done using ANOVA (post – hoc) , followed by Dunnet –t test

**Results:** The salivary total antioxidant capacity was increased on oil rinsing . On intra group comparison, since p value 0.05, there was a significant change within the groups at baseline, 15th day and 30th day. Maximum change in total antioxidant capacity was seen on chlorhexidine gargling and oil rinsing with virgin coconut oil followed by oil rinsing with sesame oil and the least on rinsing with plain water .

**Conclusions:** Virgin coconut oil rinsing has equal effectiveness as chlorhexidine on antioxidant capacity of saliva .

### **Short Term Effectiveness of Supervised use of Magnetized Water Mouth Rinse for Plaque and Gingivitis Inhibition in Children**

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**Background:** Chlorhexidine mouth rinse a 'Gold Standard' is effective in reducing plaque and gingivitis, has some drawbacks like bitter taste, light-brown staining of teeth etc. which limits its long-term use. Magnetized water is alkaline (pH as high as 9.2) and it inhibits the bonding process between plaque and teeth by "magnetohydrodynamics". The purpose of the study was to compare the effectiveness of magnetized water and 0.2% chlorhexidine for plaque and gingivitis inhibition.

**Methods:** This double blinded randomized control clinical study was carried out at a non-government high school. A total of 20 children aged 12-15 years were randomized into two groups, magnetized water and 0.2% chlorhexidine mouthwash, each comprising of 10 children who were asked to rinse with the respective mouthwash. Plaque score and gingival scores were evaluated at baseline, 2 and 3 weeks.

**Results:** In the present study,  $p < 0.05$  was considered as level of significance. Intra group comparison showed a statistically significant difference ( $p = 0.0001$ ) in reduction of the mean Plaque index (PI) and Gingival Index (GI) scores of magnetized water and Chlorhexidine, both at 2 and 3 weeks with no adverse effects. Intergroup comparison showed a statistically significant difference only in mean reduction of gingival index score at 3rd week in favour of chlorhexidine ( $t = 2.99$ ,  $p = 0.08$ ).

**Conclusions:** Daily short-term supervised use of magnetized water was safe and showed statistically significant reduction in plaque and gingival scores at 2 and 3 week compared to baseline. Chlorhexidine showed statistically significant greater reduction in gingival index score than magnetized water at 3 weeks.

## How Oral Health Literacy and the Behavior of Parents during the Meals Relate to the Experience of Dental Caries in Children: Cross-Sectional Study

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**Background:** The experience of dental caries in children has been associated with family behaviors. This study verified the association between the level of oral health literacy (OHL) of parents or caregivers, their behavior during the children meals, and the prevalence of dental caries in children (PDC).

**Methods:** In this cross-sectional study, 630 children were examined to determine the PDC and their parents were interviewed to obtain information related to socio-demographic conditions (SDC), OHL using the Brazilian version's of the Rapid Estimate of Adult Literacy in Dentistry – 30 (BREALD-30) and the Parent Mealtime Action Scale (PMAS). The analysis fitted zero-inflated negative binomial regression models to assess unadjusted and adjusted associations between the study outcome and covariates as the BREALD and PMAS.

**Results:** In the unadjusted analysis of PDC, SDC and OHL were associated with the outcome ( $p < 0.05$ ) and the caries severity (CS) was only associated with PMAS. In the adjusted model, PDC was more among 3- (PR=1.85, 95%CI=1.19-2.87) and 4-year-old (PR=2.43, 95%CI=1.60-3.71), those with at least one sibling (PR= 1.66, 95%CI=1.18-2.33). However, children whose parents/caregivers gain  $\geq 2$  Brazilian Minimum Wage were less PDC (PR= 0.66, 95%CI=0.48-0.91). The use of rewards (PMAS) associated positively with the CS (RR= 0.90, 95%CI=0.84-0.97) and parents/caregivers with ideal levels of OHL (PR=0.66;  $p=0.045$ ) associated with a lower PDC.

**Conclusions:** There is association between parental OHL and dental caries in preschool children in the unadjusted model. The age of children, the number of siblings, the family income and the use of reward were associated with dental caries.

### Association of Oral Hygiene Practices with the Outcome of Untreated Dental Caries and its Clinical Consequences

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**Background:** There are a diversity of risk factors associated with the occurrence of early childhood caries (ECC), the mainstay for the prevention of ECC is oral biofilm removal. This study aims to evaluate oral hygiene practices related to untreated tooth decay (UDC) and its clinical consequences in children aged 3-5 years and 6-7 years.

**Methods:** Out of 250 subjects, 138 and 112 participants were recruited in the age groups of 3-5 years and 6-7 years, respectively. The UDC and its clinical consequences were measured using 'd' component of dmft/DMFT index and 'p' component of pufa/PUFA (pulp involvement, ulceration, fistula, and abscess) index, respectively. Data were analyzed by multiple logistic regression analysis.

**Results:** The overall prevalence of UDC among children aged 3-5 and 6-7 years was 94.2% and 26.7%, respectively, while 56.5% and 11.6% of pulpally involved teeth were found in the respective groups. The practice of finger brushing was found to be 4.7 times more likely to have UDC (COR = 4.71(1.21, 18.40). Brushing twice/day resulted in a 39% lower probability of having UDC (COR = 0.61(0.04, 10.09). For pulp involvement, finger brushing was 1.45 times more likely to have pulp involvement than using a toothbrush (COR = 1.45(0.73, 2.88). Children with irregular brushing habits were 3.2 times more likely to have pulp involvement (COR = 3.21(1.74, 5.93) than once/day.

**Conclusion:** Finger brushing, irregular frequency, and lack of parental supervision over child brushing their teeth, were found to be related to UDC incidence and its clinical consequences.

### **The Effectiveness of Oral Health Education using Audio-Visual Aids and Frequent Motivation on Oral Health Status among Orphan Children at Social Homes in Jordan**

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**Background:** Orphan children living in social homes lack a family environment and have poor psychological and social conditions influencing their oral health. The aim of this study was to evaluate the effect of oral health education on the oral health status (OHS) of orphans at social homes in Jordan.

**Methods:** This was a cluster randomized controlled trial with a sample of 232 orphan children ages 4-14 years, randomly divided into 2 groups: Control group (CG) (n=107) and Intervention group (IG) (n=125); each further divided into age groups: 4-6, 7-12, and 12 year-s. The two groups were examined at baseline to record DMFT/dmft, plaque index (PI) and gingival index (GI) at baseline, 3, 6 and 12 months. Children in the IG had multiple audiovisual motivation and oral health educational sessions held at each interval. The CG had no intervention.

**Results:** In 4-6 year old's, a significant improvement in PI was noticed for both IG and CG (p= 0.000, p=0.008 respectively), GI was significantly improved in the IG (p=0.000), and no change in dmft was found for the IG. In 7-12 year old's, a significant improvement in the PI, GI and dmft was found (p= 0.000 for all), with an increase in DMFT and DT in the CG (p=0.000). In the 12 years old's, there was a significant improvement in PI (p=0.002), GI (p=0.043), and a non-significant decrease in DMFT (p=0.397).

**Conclusions:** There was a favorable effect of oral health education on the OHS in orphans at social homes.



### Arginine Improves Fluoride Bioavailability in Child Formula Dentifrices

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**Background:** The study examined the effect of arginine incorporation in child formula dentifrices (CFD) on fluoride bioavailability.

**Methods:** L-arginine (L-Arg) and L-arginine monohydrochloride (L-Arg.HCl) at 2% w/w of dentifrices were incorporated in five tested commercial CFDs. Total, total soluble, and insoluble fluorides in CFDs were determined by modified Taves acid-diffusion method (TAD). Ionic F and MFP were estimated by modified direct method with standard addition technique. Arginine intervention study included determination of pH of toothpaste slurries, buffer capacity of the added Arg, potentially available fluorides (PAF) and 1-min PAF by TAD. Elemental analysis for Ca, P, Na, Cl was done using ICP-OES. Data was analyzed using 1-/2-way ANOVA with post-hoc tests with significance at p0.05.

**Results:** The insoluble F content of tested CFDs ranged from 4 to 32%. Incorporation of L-Arg and L-Arg.HCl significantly improved the fluoride bioavailability of CFDs (p0.05). Incorporation of L-Arg significantly increased pH of the toothpaste slurries (p0.05); while L-Arg.HCl decreased pH of the slurries. PCA analysis showed that L-Arg.HCl decreased pH of toothpaste slurries due to presence of Cl in the form of HCl; whereas the inherent elements/molecules – Na, P, Pi, F at different levels remain distinct with unidentified influence of arginine incorporation on the tested variables.

**Conclusion:** Incorporating arginine (L-arginine or L-arginine monohydrochloride) at 2% w/w enhances fluoride bioavailability of the child formula dentifrices.

#### Funding

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### **Effect Of Silver Dioamine Fluoride on Caries Arrest and Oral Microbial Count in Uncooperative Preschool Children: A Preliminary Study**

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**Background:** Preschool children with Early Childhood Caries (ECC) frequently exhibit uncooperative behavior for restorative procedures prompting pediatric dentists to opt for simple preventive treatment strategies. The purpose of this study was to evaluate the effect of Silver Diamine Fluoride (SDF) on caries arrest and oral microbial count in uncooperative preschool children.

**Methods:** 27 preschool children with initial carious lesions (ICDAS codes 2-5) who displayed uncooperative behavior (Frankl rating 2) to conventional restorative dental care were selected. Caries status (ICDAS criteria) was recorded at baseline and the treatment outcome (active/arrested) was visually assessed after 4 weeks. Teeth that had become black and hard without any symptoms were considered as caries arrested. The child's behavior during SDF application and any subsequent adverse reaction was documented. Unstimulated salivary samples were collected before SDF treatment and at 4 weeks follow up to assess the total nonspecific microbial count. Statistical analysis (paired t-test) was performed using the IBM SPSS software at the significance level of  $P < 0.05$

**Results:** 51 teeth were subjected to SDF treatment ( $1.89 \pm 0.93$  teeth per child). The initial ICDAS code for the majority (41.2%) of the teeth was 4 and all the teeth (100%) showed caries arrest after 4 weeks after SDF application. 25 children (92.6%) showed behavior improvement to Frankl rating 3 during the procedure and none reported any adverse reaction. There was a statistically significant reduction in the salivary microbial count before and after SDF treatment ( $P < 0.0001$ ).

**Conclusion:** SDF appears to arrest caries and significantly reduces the oral nonspecific microbial count. Further investigations with larger sample sizes are required to confirm the findings.

**Quantitative Analysis of *Bifidobacterium Longum* in Root Canal Infected Primary Teeth**

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**Background:** Root canal infection is a common consequence of dental caries. Bacteria located within advanced carious lesions, such as *Bifidobacterium longum*, are directly involved in pulpal tissue inflammation. In this study, we aimed to quantitatively analyze *B.longum* levels in two groups of primary tooth root canals, and to analyze the association between these bacteria and clinical symptoms.

**Methods:** A total of 134 primary molars were selected. Subjects were chosen from patients aged 2-10 years old who came to the pediatric dental clinic, Faculty of Dentistry, Mahidol University, and needed pulpectomy treatment. Pulpal status and diagnosis were based on American Academy of Pediatric Dentistry and the American Association of Endodontists guidelines. DNA extraction and quantitative real-time Polymerase Chain Reaction (PCR) analysis were performed.

**Results:** Subjects consisted of 70 males (52.2%) and 64 females (47.8%). Mean age was 5.25 years. Sixty-eight samples were diagnosed as having irreversible pulpitis (50.7%) and 66 as having pulp necrosis (49.3%). The ratio of *B.longum* to total bacteria in the irreversible pulpitis group was higher than in the pulp necrosis group ( $p=0.016$ ). No correlation was noted between the levels of *B.longum* and clinical symptoms.

**Conclusions:** Total bacteria levels in the pulp necrosis group were significantly higher than in the irreversible pulpitis group. The ratio of *B.longum* to total bacteria in the irreversible pulpitis group was significantly higher than in the pulp necrosis group.

## Use of Silver Diamine Fluoride and Glass Ionomer Cement in the Non-Invasive Restoration of Primary Molars: A Case Report

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**Introduction:** Silver Diamine Fluoride (SDF) is composed of ionic silver, fluoride and ammonia, which produce remineralization and help arrest carious lesions in primary teeth. Glass Ionomer Cement (GIC) releases fluoride and promotes the process of remineralization. Restoring primary molars with both materials allows for less invasive treatments. The purpose of this report is to present a case where SDF and GIC were used in non-invasive restorations of primary molars.

**Case report:** A 3.4-year-old male patient presented with a primary dentition without previous restorations, multiple occlusal carious lesions on molars 54, 84, and 85 extending into dentin on clinical and radiographic examination; and 64 with occlusal dental caries in enamel. Non-invasive treatment was performed with two applications of 38% SDF to all affected molars and restoration with glass ionomer cement. At one-month follow-up, molar 54 presented code 1 and 65, 84 and 85 presented code 0 according to the Lo and Holmgren Method; with no changes noted after six months.

**Discussion:** According to in vitro evaluations reported by Fröhlich et al., and Zhao et al., prior application of SDF does not influence the bond strength of the GIC to dentin. Therefore, the treatment in the present case report used SDF and GIC to avoid use of invasive restorations in primary molars.

**Conclusion:** The non-invasive restoration of primary molars with Silver Diamine Fluoride and Glass Ionomer Cement showed effectiveness in arresting caries at six months post-treatment.

### **Association between Dento-Maxillary Anomalies and Early Childhood Caries In a Sample of Preschool Children**

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**Background:** Early Childhood Caries (ECC) is a severe form of caries, which affects preschool children. The pattern of ECC is characteristic and pathognomonic of the condition and its consequences may affect the normal occlusion, changing the distribution of functional occlusal contact. The purpose of this study was to determine the association between dento-maxillary anomalies and ECC.

**Methods:** An examination was performed to diagnose and record the presence of dento-maxillary anomalies such as: cross bite, open bite, inverted bite, and deep bite in a sample of 80 preschool children from 3 to 5 years old with ECC. The study group was divided into 2 categories according to the dmft score: group 1 ( $dmft \leq 9$ ) and group 2 ( $dmft \geq 10$ ).

**Results:** The presence of dento-maxillary anomalies was detected in 46, 2 % of the children in group 1, and 73, 9 % in children of the group 2. In relation to the dento-maxillary anomalies studied: 37.5 % of the children had crossbite (58.3% unilateral and 41.7% bilateral); 31.3% showed an inverted bite and 30.8% had anterior open bite. Comparison between dento-maxillary anomalies and ECC, no statistically significant differences were observed. Comparing the variables dentomaxillary anomalies and dmft group, revealed a statistically significant difference between the group 2 ( $dmft \geq 10$ ) and the presence of dento-maxillary anomalies. ( $p = 0.0001$ ).

**Conclusions:** The results obtained showed that dento-maxillary anomalies affected more children with severe early childhood caries, the predominant type of dento-maxillary anomalies was unilateral crossbite.

### **Clinical, Microbiological and Radiographic Evaluation of Sealed Carious Dentin after Minimal Intervention in Primary Molars- An 18 Months Follow-Up**

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**Background:** Management of deep carious lesions can be done by minimal intervention rather than conventional removal of whole of the infected dentin. Lesion Sterilization and Tissue Repair therapy (LSTR) with triple antibiotic paste (TAP) is one of the method which enhances the physical and microbiological properties of the sealed carious dentin.

The purpose of this study is to evaluate clinical, radiographic and microbiologic success rate of Ultraconservative excavation and LSTR using TAP for management of deep carious lesions of primary teeth.

**Methods:** Forty healthy cooperative children aged 5-10 years having deep carious lesion in primary molars were randomly assigned to receive either traditional indirect pulp treatment with calcium hydroxide (Group A) or ultraconservative excavation and LSTR with TAP (Group B). Follow up was done at 6 weeks, 3, 6 and 18 months intervals.

**Results:** LSTR with TAP was found to be as effective as traditional indirect pulp treatment clinically and radiographically (p0.05). The median value of both MS and lactobacilli microorganisms in Group A at post excavation was significantly higher than Group B at 6 weeks.

**Conclusions:** Ultraconservative excavation and lesion sterilization and tissue repair with triple antibiotic paste can be an effective treatment methodology for management of deep carious lesions in primary molars.

**Early Childhood Caries Knowledge among Expectant Mothers in Kuwait**

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**Background:** Early Childhood Caries (ECC) is a highly prevalent disease in Kuwait. It poses health, economic, and social implications affecting patients, their families and communities. ECC awareness campaigns targeting expectant mothers hold a promising potential as primary prevention tools. Understanding the baseline of ECC knowledge (ECC-K) is an important foundational step in planning such interventions. The aim of this study was to assess the level of ECC-K in a sample of expectant mothers, and to identify the sociodemographic and behavioural determinants of that knowledge.

**Methods:** A multiple choice questionnaire was distributed to 430 expectant women from two maternity clinics in Kuwait. The questionnaire gathered information on the demographics, ECC-K, and the oral health behaviours of the participants. Bivariate analysis assessed the relationship between ECC-K scores and the different socio-demographic variables and oral health practices of the participants. A multiple linear regression model was developed to identify the predictors of ECC-K scores

**Results:** The response rate was 94% (n=405). The mean ECC-K score was 6.4 (standard deviation [SD] = 2.5) out of a maximum score of 14. Age, education, number of children, frequency of dental visits, and flossing frequency were significantly associated with ECC-K levels (p<0.05).

**Conclusions:** ECC-K among this cohort of expectant mothers was inadequate. Educational interventions are needed to foster better ECC preventive practices.

**Pulling Strings: Puppets as Mediating Tool for Oral Health Education**

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**Background:** The focus of interest among educators is to find teaching methods adjusted to developmental aspects in early childhood. Puppets have been used for many years as an important tool for transmitting knowledge and also for entertainment. The effectiveness of using puppets in early childhood has been demonstrated in clinical areas as having the potential to create communication, increase involvement and change attitudes. When playing with puppets, children have time to try out situations and feel with the puppets on stage, and decide if they agree or not. Based on this, a study was conducted to assess the effectiveness of use of puppets as tool for oral health education in school children.

**Methods:** The study was conducted in school children of 6-8 years in city of Ahmedabad. Children were divided into 2 two groups and were asked to fill a questionnaire-based form before imparting oral health education. After filling of form children in group A were shown a 5-minute puppet show regarding oral health education and children in group B through conventional method i.e. verbally. The questionnaire form was filled again immediately after educating children and also 1 month after instructions were given. The observations were statistically analyzed.

**Results:** The statistical analysis showed that the oral health knowledge was enhanced by using puppets as mediating tool in comparison to conventional method.

**Conclusion:** Mediation using puppets facilitated learning processes, also, children`s cooperation level increased, as did interest, attention span and their involvement in learning interaction was evident.



### **Glass Ionomer Based Sealant and Varnish in Preventing Dental Caries in Newly Erupting Permanent Molars: A Randomized Clinical Trial**

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**Background:** Newly erupting permanent molars are susceptible to pit and fissure caries as they are infra occluded, and therefore favor plaque accumulation. Glass ionomer sealants and fluoride varnishes have been used for preventing dental caries in newly erupting primary molars. The purpose of the study was to evaluate the clinical effectiveness of glass ionomer pit and fissure sealant (GI sealant) and resin modified glass ionomer based fluoride varnish (RMGI-F varnish) in preventing caries in newly erupting permanent first molars by comparing the pit and fissure caries incidence and time taken for their application.

**Methods:** In this randomized controlled trial with a parallel study design, 74 children aged 6-8 years with 182 partially erupted first permanent molars were randomly allocated into two groups, Group 1: Clinpro™ XT Varnish (RMGI-F varnish) and Group 2: Fuji VII (GI sealant). Children were evaluated at 6 and 12 months for new carious lesions using ICDAS II criteria. Statistical analysis was carried out using Chi-square test, Student's t test and Number Needed to Treat (NNT) was estimated.

**Results:** There was no significant difference in caries incidence between the groups ( $p=0.608$  and  $0.933$  at 6 and 12 months respectively) and the NNT value was 50. Time taken for application was lower for Group 1 than Group 2 ( $p=0.014$ ).

**Conclusion:** Caries preventive effect of RMGI-F varnish and GI sealant are equivocal at 12-month follow up with lesser time required for RMGI-F varnish application.

**Analysis of Oral Fluid Crystallogenic Properties in Preschool Children in Kirov City**

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**Background:** Oral fluid is a body fluid constantly washing soft and hard tissues in the oral cavity. The research below allows for assessment of oral fluid state in 5-6-year-old children using crystallographic methods of study. At this age the eruption of permanent teeth usually occurs in children. Oral fluid crystallization characteristics are determined by its biophysical properties, and may be used as a diagnostic tool for assessment, correction and stimulation of oral fluid mineralization potential.

**Methods:** Oral fluid samples were received from 48 healthy children aged  $5,17 \pm 0,06$  years and studied. Oral fluid samples were collected in the morning on an empty stomach without any stimulation. In the research “traditional” crystallography techniques were used. This method helps to study crystallogenic properties of biofluids and is based on bio-substrate crystallization without adding any chemical initiator. The data was analyzed using descriptive statistics.

**Results:** All the children were divided into two groups. Group 1 included 38 children aged  $5,15 \pm 0,43$  years, all having primary teeth only; their def index was  $3,28 \pm 0,33$ . Group 2 included 10 children aged  $5,25 \pm 0,46$  years with both primary and permanent teeth, whose def index was  $4,25 \pm 0,43$ . The children with primary teeth showed 1,08% and 1,11% higher structure and crystallization indices than those with permanent teeth. This fact suggests lower mineralizing capacity of the saliva in children in Group 2.

**Conclusion:** In the mixed dentition saliva mineralizing capacity decreases. Calcium-, phosphorus- and fluoride-containing toothpaste as well as remineralizing gel should be used to increase oral fluid mineralization potential.

**Influence of Child's Caries Status and Their Mother's Attitude on the Dental Visits: A Cross-Sectional Study**

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**Background:** Regular dental visits have a significant impact on the child's oral health status.

The aim was to evaluate and compare child's caries status and their mother's attitude on oral health, with the dental visits of the child.

**Methods:** The study protocol was approved by the Institutional Review Board and Institutional Ethical Committee. Study included 254 children (8 to 10 years) and their mothers. Children were randomly selected from 3 schools in Tiruchengode district, Tamil Nadu, India. Children were matched based on their age and socio-economic status. Informed consent was obtained from the parents prior to the study. Children were screened in their school premises under natural sunlight, by the principal investigator and their dental caries status was recorded using WHO criteria (1997). A pretested validated questionnaire was used to record the mother's knowledge and attitude on their child's oral health.

**Results:** About 59% (N=151) of mothers understood that dental caries is a preventable disease. But, 51% (N=130) of mothers never took their children for a dental visit in the last 1 year. Among them, 68.5% (N=89) of children were caries free and 31.5% (N=41) of children had caries. In spite of rating their child's oral health as average or poor, 64 mothers (49%) never took them for a dental check-up. Among the 124 children who had dental visits, 50% (N=62) had caries and 50% (N=62) were caries free.

**Conclusion:** Child's dental visit is influenced more by the mother's attitude than the child's caries status and the mother's knowledge on oral health.

**A Cross Sectional Assessment of Pattern of Breastfeeding and Early Childhood Caries Among Children Visiting a Tertiary Health Care Centre in Kavre, Nepal**

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**Background:** Breastfeeding is a popular practice in Nepal with wider scientific and socio-cultural values. The objective of this study was to assess the pattern of breast feeding and early childhood caries among children.

**Methods:** All pediatric patients of the age group three to six years were recruited. The study utilized a cross-sectional technique, verbal interview with mothers and clinical examinations of children to collect information about the pattern of breastfeeding, early childhood caries and oral hygiene practices. Data was entered in the Microsoft Excel and analyzed using SPSS. Frequency, percentage, and chi-square test were analyzed for comparison.

**Results:** Only 71% of children were exclusively breast fed in the first six months of life. Nearly 43% of children were bottle-fed and 11.7 % of children slept with bottle. Around 38 % were fed more than seven times a day. About 95 % of children were fed on demand and 92% were fed during night-time. Nearly 57 % were breast-fed for more than two years. Prevalence of early childhood caries was 93% with mean deft index 7.46.

**Conclusions:** There is a wide variation in normal breastfeeding pattern and its duration must be as long as both mother and child desires. Breastfeeding in itself is not the etiological factor for early childhood caries. Instead, oral hygiene may be the most critical factor that influences the development of dental caries thus it is essential that caregivers should be aware about optimal oral hygiene practices to prevent bacterial colonization.

Cariology and Preventive Dentistry, Infant Oral Health

### **Health Promotion in Pediatric Dentistry Using Audiovisual Tools: The Milk-Tooth Project, an Initiative of Brazilian Pediatric Dentists**

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**Background:** In childhood, the development of ludic activities is one of the most important resources for learning and knowledge construction. Therefore, in Pediatric Dentistry, these activities should be adopted whenever possible, as a wise form of oral health promotion and education. The aim of this work was to produce and record children`s songs, in Portuguese, with health promotion and education content, as well as to quantitatively assess its audience after dissemination on social media platforms.

**Methods:** The project`s songs were written by Prof.<sup>a</sup> Dr. <sup>a</sup> Alexandra Mussolino de Queiroz and masters student Paôla Caroline da Silva Mira, from the Department of Pediatric Dentistry, School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil. All songs were designed and produced to stimulate the child`s approach and oral health themes in a playful, funny and artistic way. After musical production by specialists in children`s music, the songs were released on social networks (Facebook, Instagram and YouTube). Data generated by these platforms were used for quantitative assessment of the scope of this educational work.

**Results:** Five months after the audiovisual content`s release, the “Milk-Tooth Project” page reached approximately 19,650 people, with access spread over 15 countries, 11 states and 45 Brazilian cities.

**Conclusion:** The quantitative results showed that the songs produced covered an immense territory and widely reached people from different parts of the world, positively influencing health professionals, Pediatric Dentistry professors, undergraduate and graduate students, parents and children.

## A Cross-sectional Survey of General Dentists' Perceptions on the Usefulness of Bitewing Radiographs when Diagnosing and Managing Caries in Children

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**Background:** Bitewing radiographs are useful adjuncts to clinical examination for caries detection. In the UK, evidence-based guidelines have been published to support clinicians in the decision-making process of when and how often bitewings should be taken. The purpose of this study was to gain an insight into UK general dentists' perceptions on the usefulness of bitewings when diagnosing/managing caries in children.

**Methods:** A questionnaire for self-completion was distributed online via closed social media groups for registered UK dentists. Only general dentists who were actively practising in the UK and who treated both children and adults were invited to complete the survey.

**Results:** A total of 350 responses were received from dentists with experience ranging from 1 year to 20 years. Although most (74%) general dentists agreed that bitewings were useful adjuncts for caries diagnosis/management in children, and 51% thought that bitewings were equally useful for adults and children, the majority (76%) still only take them 'about half the time' or less frequently for this purpose. The majority (80%) also self-reported to follow the national guidelines on bitewing intervals more often for adults than for children. The most common barriers to taking bitewings in children were poor child cooperation (327/350), film or film holder size issues (269/350), prominent gag reflex (143/350), and not enough time (110/350).

**Conclusions:** There is a discrepancy between the perceived usefulness and the actual use of bitewings for children among general dentists, which suggests that its benefits as diagnostic tool is not being fully utilised.

**Comparison of the Efficacy of Parental Brushing Using Powered Versus Manual Tooth Brush in Removal of Plaque - A randomized, Four Period, Single Blinded Crossover Study**

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**Background:** Children less than 5 years of age need parental assistance for tooth brushing. Powered toothbrush could be recommended for parents to brush their young children's teeth. The purpose of the present study was to find the efficacy of powered toothbrush when used by parents to brush their children's teeth.

**Methods:** This was a randomized, four period, two treatment, examiner blinded crossover clinical trial. The children belonged to age between 3 and 5 years. Tooth brushing was done by the parent using either manual or powered brush. Plaque assessment was made method using Turesky Modified Quigley-Hein plaque index. The statistical analysis: The level of significance was set at 5% (i.e., p 0.05). The difference in plaque score was calculated using paired t test.

**Results:** A significant difference (p 0.001) in the reduction of plaque score was observed for both manual and powered brush groups.

**Conclusion:** Powered toothbrushes performed significantly better than the manual toothbrushes in plaque removal when used by parents to brush their child's teeth.

### Fluoride Levels of Children's Toothpaste in Australia

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**Background:** It is accepted amongst dental authorities world-wide that children should brush with fluoridated toothpaste, due to the clear evidence of its effectiveness in reducing dental caries. In Australia the recommendation for fluoride in toothpaste is 500-550ppm for pre-school aged children. The purpose of this study was to investigate the range of children's toothpaste available for purchase in Australia and the related fluoride content.

**Methods:** An audit of all toothpastes marketed for children and available to purchase both online and in-store in the Macarthur region of Sydney was conducted. Stores included pharmacies, supermarkets, dental surgeries, and discount stores, as well as any online store with an Australian address. The toothpaste was purchased and data collected included ingredients, country of manufacture and fluoride content.

**Results:** 107 individual children's toothpastes were identified in the audit, with 55 different manufacturers purchased from 21 different retailers. Sixty-seven (62.6%) of available toothpastes contained no fluoride. Of the 40 toothpastes containing fluoride, only 11 (10.3%) contained fluoride levels recommended by the 2019 Australian Fluoride Consensus Workshop of 500-550ppm. None of the 22 (20.6%) Australian manufactured toothpastes contained fluoride.

**Conclusion:** 89.7% of children's toothpaste available for purchase in Australia failed to meet the recommended fluoride levels required for pre-school children in Australia, with 62.6% of toothpaste containing no fluoride. These results indicate that there has been a major decrease in fluoridated toothpaste use in Australian children, contrary to expert recommendations and suggests an urgent need for further research into this area.



**Distribution of Dental Caries in the Oral Cavity of Children Aged 1 to 3 Years**

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**Background:** This study evaluated the distribution of dental caries in the oral cavity of children aged 1 to 3 years, considering each tooth as well as its surfaces.

**Methods:** 333 children were examined in the city of Diamantina, Minas Gerais. Oral clinical examination was performed through the International Dental Caries Assessment and Detection System (ICDAS). Each dental surface was evaluated according to the presence of non-cavitated (ICDAS 1 to 2) and cavitated lesions (ICDAS 3 to 6).

**Results:** Considering non-cavitated lesions, central incisors (51 = 5.7% / 61 = 5.9%) and lateral (52 = 6.7% / 62 = 5.7%), upper second molars (55 = 6.1% / 65 = 4.8%) and lower (75 = 5.7% / 85 = 3.3%) were more frequently affected. Cavitated lesions were more frequent in the upper central incisors (51 = 14.2% / 61 = 14.0%) and lateral (52 = 10.3% / 62 = 12.3%) upper incisors, upper first molars (55 = 7, 5/65 = 8.1) and lower (75 = 5.3 / 85 = 5.9). The surfaces most affected by non-cavitated lesions in anterior teeth were the vestibular and mesial surfaces. In the posterior teeth, the buccal and occlusal teeth were more affected.

**Conclusion:** At the age of 1 to 3 years, upper incisors and first molars are the teeth most affected by caries. Vestibular faces are the most affected by non-cavitated lesions in all teeth and by cavitated lesions in upper anterior teeth. Occlusal surfaces are the most affected by lesions cavitated in posterior teeth.

## The Impact of Early Childhood Factors on Dental Caries Incidence in Children's First Permanent Molars: A 7-year Cohort Study

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**Background:** Although dental caries in first permanent molars has long been investigated, the studies are inconclusive in determining the contextual and individual factors that impact on this outcome. In this study, we aimed evaluate the influence of contextual and individual factors on dental caries incidence in first permanent molars.

**Methods:** This 7-year cohort study was conducted with a representative sample of 639 children (1–5 years) who had been assessed initially in 2010. Dental caries was assessed using the International Caries Assessment and Detection System. Contextual and individual variables were collected at baseline. A multilevel Poisson regression model was used to investigate the influence of individual and contextual characteristics on dental caries incidence in first permanent molars (incidence rate ratio –IRR- and 95% confidence intervals - 95% CI).

**Results:** From the 639 children, a total of 449 children were re-assessed after 7 years (70.3% retention rate). The incidence of dental caries in first permanent molars was 18%. Children who lived in neighborhood with cultural communities' centers have lower risk to dental caries in first permanent molar at the follow-up (IRR 0.78; 95% CI 0.62–0.99). Low family income (IRR 1.34 CI95% 1.03-1.76) and poor parental perception on child oral health (IRR 1.56 CI95% 1.18-2.06) were associated with higher risk of dental caries in first molars.

**Conclusions:** Distal individual and contextual determinants showed an important role in the incidence of caries in first permanent molars. Our results contribute to the identification of groups at higher risk for dental caries incidence.

### **The Effect of Oral Health Education to Teachers on Oral Health Condition of a Primary School Children in Cambodia**

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**Background:** Cambodia currently lacks dentists because of the civil war in the late 1970s. Therefore, most people find accessing dental clinic services very difficult. Additionally, few opportunities exist for health education, and oral health awareness is very low. Consequently, many children experience dental caries. This study aimed to examine the effects of an oral health education program for public primary school teachers on students' oral health.

**Methods:** We visited a public primary school in Siem Reap, Cambodia, once annually, from 2011-2015. During these visits, we conducted a workshop for primary school teachers on oral health education. We carried out oral examinations with total 2,637 students (grades 1-6) and calculated the prevalence of dental caries, number of decayed and filled teeth (DFT), and percentage of decayed and filled teeth (DFT rate). The children were divided into two groups for data aggregation: lower (grades 1-3) and upper grades (grades 4-6).

**Results:** Oral examinations revealed a high prevalence of dental caries in primary and permanent teeth (over 90% each year), which significantly decreased among the upper-grade students. Mean number of DFT and the %DFT significantly decreased in both groups. In the future, we plan to expand existing oral health programs and establish new ones among Cambodian primary schools.

**Conclusions:** Despite the persistently high prevalence of dental caries, the oral health status of the schoolchildren improved year-on-year. Participation in the workshops may have improved the teachers' ability to provide oral healthcare instruction, leading to the suppression of dental caries among pupils.

**“Comparison of the Effect of Two Commercially Available Fluoride Varnishes on Levels of Salivary Fluoride, Calcium and Phosphate Ions in Children: A Randomized Controlled Trial”**

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**Background:** Dental caries is the result of a dynamic cycle of demineralization and remineralization. The extent and severity of the disease varies in different individual. Professionally applied fluoride varnishes are widely used by professionals in prevention of dental caries. The present study evaluated and compared the levels of salivary fluoride, calcium and phosphate ions between two commercially available fluoride varnishes.

**Methods:** Twenty-four children were selected and divided into two groups: MI varnish group (n = 12) and Embrace varnish group (n = 12). The saliva samples were collected before application of fluoride varnishes and after application at 24th hour, 7th day and 14th day. After collecting the saliva sample, estimation of fluoride ion by fluoride ion electrode, estimation of calcium and phosphate ion by calcium and phosphate ion measurement kit and estimation of pH by digital pH meter was done.

**Results:** MI varnish was found to have a greater potential to release fluoride ions. Mean salivary fluoride levels at the end of the study period in MI group and Embrace group were  $0.253 \pm 0.095$  and  $0.095 \pm 0.043$  respectively. After 7 days, mean calcium ions recorded in MI group and Embrace group were  $11.43 \pm 4.62$  and  $7.41 \pm 4.05$  respectively. ( $p \leq 0.05$ ). Values of phosphate ions were more or less similar at baseline and at 7th day study period. No significant difference was recorded in the pH values for both the groups for all time intervals.

**Conclusions:** MI Varnish containing CPP-ACP showed more promising results. Embrace varnish can be used as an alternative to MI varnish.

**Early Childhood Caries of 4-5 Years Old Children in Erzurum, Turkey**Fatih Sengul<sup>1</sup>, Gelengül Urvasızoğlu<sup>2</sup>, Tarek Seddik<sup>1</sup>, Sera Derelioglu<sup>1</sup><sup>1</sup>*Department of Pedodontics, Faculty of Dentistry, Ataturk University, Erzurum, Turkey*<sup>2</sup>*Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Ataturk University, Erzurum, Turkey*

**Background:** Early Childhood Caries (ECC) is dental caries in children under 72 months old, associated with multiple predisposing factors and having a negative impact on the quality of life. In this study, our aim was to assess the oral health conditions and ECC prevalence of children in the city of Erzurum, Turkey.

**Methods:** Our cross-sectional epidemiological study was conducted in Ataturk University, Faculty of Dentistry, Pediatric Dentistry Department/Erzurum-Turkey, between 2015-2016. A total of 1156 preschool children, 588 girls and 568 boys with an age median of  $4.9 \pm 0.27$  were included in the study. Restorative care index (RI), dmft, Significant Caries Index (SiC), SiC10, Treatment needs, Care Index and prevalence distribution of carious primary teeth were evaluated. All statistical assessments in the study were performed using SPSS 25 (SPSS Inc., Chicago IL USA) with a 5 % level of significance.

**Results:** 73.27% prevalence of ECC was observed in preschool children with a mean dmft score of  $3.89 \pm 4.08$  and an increase in ECC with the age. We found restorative index as 2.23, SiC as 8.99, SiC10 as 12.36, Treatment needs as 93.55, Care Index as 2.13, and number of lost primary teeth per 100 children as 0.9.

**Conclusion:** High level of ECC revealed the necessity of starting an oral health educational program for mothers and dental screenings for children and the demand for improving the oral and dental services.

**Comparison of the Remineralizing Effect of Brushing with Aloe Vera versus Fluoride Toothpaste**

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**Background:** Fluoride in dentistry is considered a primary agent in the prevention of tooth decay. Indeed, fluoride increases remineralization, inhibits demineralization and has an antibacterial effect. But recently, some controversies about the administration of fluoride started to take place, making it essential to find an alternative to the fluoride toothpaste by natural products. Among these products, Aloe Vera (AV) is the most commonly used. Indeed, it is a plant known for its antibacterial, anti-fungal and antiviral properties. Studies have also suggested its ability at optimal concentrations, to prevent cariogenic bacteria. But so far, no study has proven its ability to induce dental remineralization.

**Methods:** Forty sound extracted teeth were placed in a demineralizing solution for 4 days and randomly assigned to four groups: Group A: 1,450 ppm fluoride toothpaste; Group B: AV with non-fluoridated toothpaste; Group C: AV with 1,000-ppm fluoridated toothpaste; Group D: AV gel. A 3 minutes pH cycling was carried out twice a day for each group for 12 days. Specimens were analyzed before and after by Scanning Electron Microscope - Energy Dispersive X-Ray (SEM-EDX).

**Results:** Following remineralization, the Ca:P ratio increased in all groups. The difference of the Ca:P ratio was not significant between groups C, D and A. The mean ratio was significantly lower in group B ( $p = 0.026$ ).

**Conclusions:** The AVgel demonstrated a remineralization capacity equal to that of the 1,450-ppm fluoride toothpaste. In contrast, fluoride-free AV toothpaste showed a lower remineralization efficiency. Further studies are required to understand its mechanism.

**Development and Validation of a Novel Child Oral Health Related Quality of Life Questionnaire**

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**Background:** Child's oral health related quality of life (OHRQoL) is influenced by its functional, psychological and social well-being. The aim was to develop and evaluate the content and concurrent validity of a novel OHRQoL scale for children in Tamil Nadu, India.

**Methods:** The questionnaire was developed based on the oral health related factors affecting Indian children in their early mixed dentition period (6-9 years). It was sent to 10 senior pediatric dentists in Tamil Nadu for validation using the Content Validity Index (CVI). Each item was scored on a Likert scale of 1-4 for its relevance and adequacy. This validated 20 item questionnaire and the parent-caregiver perception questionnaire (PCPQ) were emailed to 130 parents from 13 randomly selected districts in Tamil Nadu for concurrent validation. Concurrent validation was done using Spearman's rank order correlation coefficient test.

**Results:** Item-content validity index (I-CVI) score for each question was calculated. The average scale score (S-CVI/Avg) was 0.93 and 0.92 for relevance and adequacy respectively. Universal agreement scale score (S-CVI/UA) was 0.44. One hundred and nineteen parents filled both forms in 2-3 days. There was statistically significant positive correlation ( $r = 0.7$ ;  $p < 0.001$ ) between the two questionnaires. Post hoc power analysis, based on the sample size ( $n=119$ ), alpha error of 5% and 0.5 effect size showed that the power of the study was 96.7%.

**Conclusion:** This scale is a promising new tool to assess the OHRQoL of children in Tamil Nadu, India. Further research is planned to assess the discriminant validity of the scale.

**Use of Silver Diamine Fluoride in Pandemic by COVID - 19: Case Report**

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**Introduction:** The Latin American countries, on the one hand, are among the most affected by COVID-19 and, on the other, they have a high prevalence of caries (78%). Pediatric dental care is a latent risk of infection by sick patients with or without symptoms, due to the production of fluids and aerosols during clinical care. Non-invasive treatments are the best choice in this situation, in order to avoid the use of the handpiece. The use of diamine silver fluoride (SDF) has shown three important actions: remineralize, seal the dentinal tubules and inhibit the enzymatic activity of cariogenic bacteria. The objective of this report is to present the results of the use of SDF in incipient carious lesions.

**Case report:** Apparently healthy 9.5-year-old male patient. Upon oral clinical examination, poor oral hygiene, incipient and active carious lesions on the first permanent molars (ICDAS 2), and generalized marginal gingivitis are observed. Each molar was treated using local anesthesia, absolute isolation, and SDF was applied to the uncavitated lesions, using a medium microbrush, keeping the humidity for 3 minutes, and the surpluses were removed with cotton. In the first session it was performed on the 26 and 36 and in a second session on the 16 and 46. The lesions remain inactive after 6 months of observation.

**Discussion:** Although one of the disadvantages is the blackish color it causes, there was no refusal on the part of the patient and his mother, who were informed of the procedure taking into account the contingency situation.

**Conclusion:** The placement of SDF in incipient lesions of the first molars, achieved their arrest in a simple, fast, effective and safe way, being a technique that could enter the biosecurity protocols in Pediatric Dentistry worldwide.



## May Clinical Experience During the Undergraduate Course Influence Caries Detection and Treatment Decision Making?

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**Background:** The aim of this study was to evaluate caries treatment decisions made by undergraduate students supported by ICDAS or Nyvad's criteria at different moments in the academic life.

**Methods:** Twelve students analyzed 90 digital photographs of permanent teeth at different clinical stages of caries lesion development and they choose among different treatment at three different assessments: 1<sup>st</sup> - without previous experience, in the second year of Odontology course; 2<sup>nd</sup> –one week after, with criteria training (ICDAS = 6; Nyvad = 6); and 3<sup>rd</sup> - in the fourth year of their course (ICDAS = 6; Nyvad = 6), two years after the 1<sup>st</sup> assessment. Reference standard was established cooperatively by two experienced researchers. Criteria performance was evaluated by sensitivity, specificity, area under ROC curve and Kappa statistics. Treatment decision was described in percentage by contingency tables and Spearman's correlation with the reference standard.

**Results:** At the 1<sup>st</sup> assessment, there was high percentage of operative treatment even for initials lesions in enamel observed by ICDAS criteria and some treatment was proposed for both, active and inactive lesions, observed by the Nyvad's criteria. At the 2<sup>nd</sup> assessment, the students were still recommending treatments for initials or inactive lesions. At the 3<sup>rd</sup> assessment, the treatment decisions presented greater cohesion in relation to the classification criteria. The differences between the criteria were not relevant in terms of diagnostic accuracy during the 3<sup>rd</sup> assessment.

**Conclusion:** The clinical experience could improve the caries detection and treatment decision, regardless of the criteria used.

**Comparative Study of a Cariostatic and Fluoride Varnish in the Paralysis of Initial Caries Lesions**

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**Background:** Caries is a multifactorial disease, dependent on the presence of biofilm. Due to the possibilities of paralysis methods and initial diagnosis of caries, this study aimed to compare the efficacy of silver diamine fluoride (SDF) with fluoride varnish in first permanent molars at different stages of eruption by means of a randomized clinical trial.

**Methods:** A randomized clinical trial was conducted to select 165 children between 6 and 12 years of age who presented with carious lesions with ICDAS codes 1 and 2 on the molar occlusal surface. The sample was randomly divided into two groups: G1 (38% SDF potassium iodide-associated) and G2 (5% fluoride varnish). The lesions were classified using ICDAS and according to the stages of eruption. Re-evaluation of the indices and control of the interventions were performed after 6 months.

**Results:** G1 teeth were significantly more frequent in the 0 eruption stage compared to G2 teeth ( $P = 0.009$ ). Thus, G1 had 73 and G2 66 teeth. There was no significant difference between the groups regarding the eruption stage after the intervention ( $P = 1.000$ ). G1's teeth had a significantly higher frequency in the 0 ICDAS score when compared to G2's.

**Conclusion:** The eruption stage of the teeth was not associated with ICDAS in any of the groups analyzed after the interventions. SDF was more effective in stopping caries when compared to fluoride varnish.

### Translation and Validation of Oral Health Related Early Childhood Quality of Life Tool for Nepalese Preschool Children

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**Background:** Early childhood caries in preschool children debilitate their quality of life affecting oral function, appearance and social well-being. The untreated dental caries with severe consequences in preschool children of Nepal is high. A tool for oral health related early childhood quality of life (OH-ECQOL) for north Indian population was translated into Nepali language and validated.

**Methods:** Forward translation of a set of 18 questions was done by two Nepalese professional translators which was back translated by professional English translator. This was sent to three independent advisors to see the appropriateness of translation. Pilot testing was done in 20 parents and questionnaire was finalized after needed corrections. Final version was introduced to the 118 parents of children aged 24-71 months. Oral examination was carried out to record the status of early childhood caries. Concurrent, construct, discriminant validity and internal consistency reliability, test-retest reliability were evaluated.

**Results:** OH-ECQOL scores and perception of parents for general and oral health of their children was significant (at 0.01 level) and it increased with severity of caries. There was also a significant correlation of child impact section with family impact section (at 0.01 level). Cronbach's alpha was 0.891 demonstrating good internal consistency. Intra class coefficient was 0.963 suggesting excellent test-retest reliability. 91(77.1%) of children had severe ECC and 40(33.8%) parents were from upper middle class.

**Conclusion:** The Nepalese version of OH-ECQOL is a valid and reliable tool for assessing the oral health related early childhood quality of life in children of Nepal.

## The Effect of Socioeconomic Class on the Oral Healthcare Practices of Secondary School Students in Lagos, Nigeria

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**Background:** Secondary-school students are at a crucial stage in their life where decisions on oral health transit from the role of parents/guardians to their sole responsibility. Understanding factors that influence their oral healthcare practices is of paramount importance. Socioeconomic class (SEC) has been suggested to have a varied effect on oral health. Therefore, the aim of this study was to determine the effect of SEC on the oral healthcare practices of secondary school students

**Method:** A total of 385 secondary-school students in Surulere, Lagos, Nigeria were selected by multistage sampling method. Information collected via a self-administered questionnaire included socio-demographic characteristics, SEC using the family affluence scale by Currie 1997, oral hygiene practices, dietary habits, oral healthcare utilization and oral health perception. Data collected were analyzed using Epi Info statistical analysis software.

**Results:** A total of 370 students with a mean age of 14.95±1.44 participated in the study. 32% of the study population was of low SEC, 55% of middle class and 13% of high class. There were significant associations between high SEC and brushing twice daily (p0.05), using dental floss (p0.05), consuming carbonated drinks (p0.05) and oral healthcare utilization (p0.05). The mean OHI score was 1.12 and the higher the SEC, the better the OHI (p0.05). The prevalence of dental caries was 15% with mean DMFT of 0.25. Caries experience increased with SEC (p0.005).

**Conclusion:** Higher SEC led to better oral hygiene and oral hygiene practices but also led to poorer dietary habits and caries experience.

### **Horizontal Transmission of Streptococcus Mutans in Children and its Association with Dental Caries: A Systematic Review and Meta-analysis**

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**Background:** Vertical transmission of cariogenic microorganisms occurring among caregivers and children have been analyzed in various studies. However, a significant proportion of children attend nursery and schools globally, where they have a range of contact, providing a favorable environment for the transmission of cariogenic microorganisms. The present systematic review was conducted to provide an evidence-based summary regarding the horizontal transmission of oral *S. mutans* among young children.

**Methods:** Seven databases were searched for observational studies that have determined the transmission of *S. mutans* among children of less than 7 years of age. Selection of the included studies, data extraction, and the quality assessment through Downs and Black (1998) system were performed independently by two authors. The inverse variance random-effect approach was used to pool the results and statistical heterogeneity was evaluated using I-squared statistics.

**Results:** Fifteen studies were included for the qualitative synthesis, 5 of which were pooled for quantitative analysis. The Risk Ratio (RR) of sharing only one genotype in caries-free children versus children with caries was found to be 0.60 (95% CI: 0.45-0.80; P=0.000). The RR of sharing more than one genotype was 1.46 (95% CI: 1.13-1.89; P=0.004) in children with caries versus caries-free children. This implies that children sharing only one genotype had a 40% lesser chance and children sharing more than one genotype had a 46% higher chance of having caries.

**Conclusions:** The current systematic review provides evidence of the horizontal transmission of oral *S. mutans* and its association with dental caries.

**Caries Management Pathways- A Holistic Approach of Caries Management in Pediatric Population: An Observational Study**

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**Background:** Existing approach of managing Dental caries has not been able to reduce disease burden all over the world. Dental caries disease burden is well acknowledged by the WHO as well in underdeveloped and developing countries. This has led to the concept of `caries management pathway` (CMPs). International Caries Classification and Management System (ICCMS) is one of the most recent CMP. Present study was planned to observe effect of ICCMS on control of dental caries in paediatric dental patients.

**Methods:** Study was planned as prospective observational for a cohort of 40 participants (age 8-12 years) All participants were observed for new carious lesions and progression of lesions for one year, with all protocols of ICCMS implementation.

**Results:** All sound surfaces retained same status. No new lesion was observed over one year. Out of 170 surfaces diagnosed with caries at baseline, 10 % were initial active, 22% initial inactive, 16% moderate active, 10% moderate inactive, 42% extensive active and no extensive inactive lesion. All initial active lesions reversed (p 0.001), therefore, initial inactive lesions increased but the change was statistically not significant. All Moderate lesions decreased but change was statistically not significant. Extensive active lesions increased significantly.

**Conclusion:** Control of dental caries is possible with effective implementation of CMPs like ICCMS. Lesions in early stages are more easy to control than advanced lesions.

**Working Mothers Impact on Oral Health Status of 2-5 years old Children in Erzurum, Turkey**

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**Background:** The incidence of early childhood caries, which is one of the most common chronic childhood diseases in children. Researchers have stated various risk factors for these caries lesions, which are rapidly increasing and have many difficulties in their prevention and treatment. The purpose of this study was to evaluate the oral health status of 2-5 years old children and the working status of the mother in Erzurum/Turkey.

**Methods:** 92 children who applied to Ataturk University Faculty of Dentistry, Erzurum / Turkey for examination or treatment were included in our study. Oral examinations of the children were performed in a clinical setting and the study form was filled. Data analysis was performed using the Statistical Package for Social Sciences software.

**Results:** In our study 20.65% of the children had working mothers. The rate of cleaning the teeth before bedtime ( $p = 0.003$ ) and cleaning with their mothers ( $p = 0.002$ ) was found to be higher in working mothers. Although the dmft ( $p = 0.016$ ) and d ( $p = 0.001$ ) scores in children of working mothers were lower, the rate of caries in the anterior teeth ( $p = 0.004$ ) was higher.

**Conclusion:** Working mothers who help their children to brush their teeth have been observed to reduce the caries rate. However, the time allocated for cleaning the front teeth was considered to be relatively shorter. Therefore, optimizing the brushing times of the teeth can be suggested by explaining the effective brushing methods to the parents.

**‘Taught to Teach’ – A Pedagogical approach towards School Based Dentistry**

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**Background:** Dental Caries has a mean prevalence rate of 49% among school children worldwide. School teachers are suitable personnel to impart dental health education among school children by playing an important role in developing healthy oral habits. However, certain disadvantages like insufficient training to deliver oral health education prevents the teachers from teaching children effectively. The aim was to assess the effectiveness of training School teachers on oral hygiene measures of 5 – 15 year-old public school children in Davanagere, India.

**Methods:** A total of 10 school-teachers and 400 school children were included in this study.

Before commencing the training programme, A well-structured, validated questionnaire to evaluate teacher’s knowledge, awareness and practice towards oral hygiene practice.

PHASE I: Teachers Training Programme was conducted which focused on Counselling teachers on dental health practices including proper diet and oral habits.

PHASE II: Dentists gave a supervised Tooth Brushing Demonstration via videos and models.

PHASE III: Teachers Demonstrated and Educated school children to maintain their oral hygiene. After 3 months, Teachers were asked to answer the same questionnaire again.

**Results:** Baseline and 3 months data were compared; statistically significant results were obtained. An Excellent Response was achieved from the School teachers after the Training Programme.

**Conclusions:** The present study demonstrated a drastic improvement in Oral Hygiene of school children at the end of 3 months. Thus, it implements that teachers should be trained comprehensively regarding importance of oral health which will build confidence as well as a positive attitude in school children through their teachers.



**Intensive Prevention in the Patient with Congenital Heart Disease: Getting to the Heart of the Matter**

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**Introduction:** Patients with Congenital Heart Disease (CHD) are at an increased risk of Infective Endocarditis (IE), a life-threatening bacterial infection of the endocardium of the heart. Management of these children can be challenging, as they undergo multiple medical procedures, with frequent hospital visits.

**Case Report:** A 5-year-old male was referred to University Dental Hospital of Manchester for assessment, with a history of intermittent dental pain. Medically he had an atrioventricular septal defect with ventricular imbalance. The patient had undergone cardiac surgery, including a PA band, repair of aortic arch and AV valve, right sided bidirectional cavopulmonary shunt and was awaiting a Fontan procedure. Clinical and radiographic examination revealed severe early childhood caries affecting all maxillary primary teeth and his mandibular primary molars. Management included an enhanced prevention regime and discussions of risks of IE. All carious teeth were extracted under general anaesthetic and fluoride varnish was placed on his remaining dentition.

**Discussion:** Children with CHD who are diagnosed with dental caries are at higher risk of IE due to risk of bacteremia from the oral cavity. In addition, untreated dental decay can lead to delays or cancellations of cardiac surgery. This highlights the importance of maintaining good oral hygiene, therefore early dental visits and enhanced prevention can in turn help to reduce the risk of IE.

**Conclusion:** Prevention is an essential component of management of these patients. Regular recalls are advised and if dental disease is diagnosed, treatment is required to ensure that they are dentally fit for cardiac surgery.

### Effectiveness of a Novel Nano-Silver Fluoride with Green Tea Extract Compared with Silver Diamine Fluoride: A Randomized, Controlled, Non-Inferiority Trial

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**Background:** Recently, Silver Diamine Fluoride (SDF) has been demonstrated by various investigators, to be effective in arresting dentin carious lesions. However, the application of SDF creates dark black staining of caries tissues, which can be a significant drawback of its use. Thus, the aim of this study was to evaluate whether the cariostatic efficacy of a biologically synthesized novel Nano-Silver Fluoride with green tea extract (NSF-GTE) is non-inferior to Silver Diamine Fluoride (SDF) 38% in deciduous teeth in preschool children.

**Methods:** This study was a randomized, single-blinded, non-inferiority clinical trial. Sixty-three preschoolers with a total of 164 active lesions were selected and randomly assigned into two groups (A: 32 children with 83 lesions treated with NSF-GTE - B: 31 children with 81 lesions treated with SDF). Clinical evaluation was performed at 21 days, 3 and 6 months after treatment using International Caries Detection and Assessment System (ICDAS II) criteria to assess carious lesions activity. Non- Inferiority margin was set at 15%.

**Results:** At six months, Total arrest rate was 67.4% and 79.6% for NSF-GTE and SDF respectively (P 0.05). Furthermore, 95% confidence interval of the Relative Risk for (group A) at the three follow-up periods lies entirely below the predefined margin in comparison to (group B). Also, it was observed that anterior teeth and single surface lesions had higher arrest rates as compared to posterior teeth and multiple surface lesions (P0.05).

**Conclusion:** Non-Inferiority was demonstrated, and both SDF and NSF-GTE presented cariostatic efficacy in primary teeth. However, NSF-GTE didn't cause Staining.

**Machine Learning Based Model Construction for Caries Risk Assessment in Preschool Children**

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**Background:** Caries risk assessment in preschoolers is essential in adopting public health policies. It requires the analysis of multiple interdependent variables for a specific population. Machine learning algorithms show great capabilities in recognizing significant data patterns in previous studies. This study aimed to use machine learning methods to select the most relevant variables in the prediction of dental caries in preschool children.

**Methods:** This is a 2-year cohort study that was conducted with a random sample of 467 preschool children from southern Brazil. A supervised machine learning method was applied to build a model capable of classifying the presence or absence of caries in children, using a J48 decision tree algorithm. This method was compared to a classical logistic regression analysis using accuracy, precision, recall, and F-measure.

**Results:** The incidence of caries lesions in the sample was 2.01 (Standard Deviation 3.77). The accuracy of the machine learning-based method was 77.41, slightly higher than that achieved with the logistic regression (76.44). Therefore, the decision tree provided a self-explanation of the intricate relationship between multiple variables, including clinical, socioeconomic, and demographic variables. The severity of previous dental caries appears at the root level for the selection of individuals at high risk of developing the disease, in agreement with widely recognized results.

**Conclusions:** This study reveals the potential of machine learning methods in assessing the risk of dental caries in preschool children. The model obtained using the tree classifier showed better accuracy when compared to logistic regression algorithms.

**Determinant Factors of Dental Caries Incidence in Schoolchildren: A 7-year Longitudinal Study**

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**Background:** Dental caries (DC) is a major public health problem that substantially affects individuals, families, and the community's lives. Longitudinal studies in oral health become essential in order to verify which exposure factors would be related to an oral health outcome. The aim of this study was to investigate determinant factors related to the incidence of DC in Brazilian schoolchildren, after a period of seven years.

**Methods:** At baseline (T0), 851 students from 7 to 12 years old were included. All participants who after 7 years had not received any orthodontic treatment were invited to participate in follow-up (T1) (n = 411). Descriptive analysis, chi-square tests, Mann-Whitney, and Poisson hierarchical regression were performed.

**Results:** A total of 330 students participated in the two moments of the study. The DC incidence was 64.8%. The final model of Poisson Regression revealed that students whose mothers had eight years of schooling or less had a 19% greater risk of developing DC (95% CI 1.03-1.38; p = 0.020). In addition, those who had previous caries experience (95% CI 1.24-1.80; p 0.001) and a poor self-perception of oral health during the baseline (95% CI 1.01-1.37; p 0.032), had 49% and 18% greater risks of developing new caries lesions after seven years, respectively.

**Conclusions:** Previous experience of DC, low maternal education, and poor self-perception of oral health were considered risk factors for the development of new caries lesions among students after a period of seven years.

**Reconstruction of Anterior Deciduous Teeth Affected by Early Childhood Caries: Case Report**

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**Introduction:** Early childhood caries (ECC) is characterized by the presence of one or more decayed surfaces, cavitated or not, lost or restored, in any deciduous tooth of children under six years old. The disease is determined by the consumption of sugar and mediated by biofilm, that suffer influences from various environmental, social, and behavioral components, which means that the environment in that the individual is inserted have a fundamental influence. The purpose of this report is to present a reconstruction of anterior teeth of a 3-year-old baby with ECC.

**Case report:** After removing decayed tissue, the composite resin was accommodated in the prefabricated celluloid matrix, which was adjusted to the compatible size of the crown. It was taken into position filled by the material until it overflow and the excess removed with an explorer probe. After photopolymerization and remove the matrix, the adjustments were performed. The finishing and polishing were given in the following consultation. At each meeting, the mother received instructions about diet and hygiene.

**Discussion:** Primary incisors reconstruction with the anatomical celluloid matrix is well accepted, due to the low cost, restoring aesthetics and function, with reduced clinical time generating less discomfort for the patient. The composite resin allows color stability, resistance and durability. in addition, the success of the treatment relies deeply on the collaboration of the family.

**Conclusion:** A low cost treatment and motivating those responsible for the children it's possible to achieve success in treatment, return health and satisfaction of parents and patient.

**Detection of Proximal Caries in Primary Teeth Using a Deep Learning Based Convolutional Neural Network**

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**Background:** Dental caries is the most prevalent dental chronic disease affecting most of the people worldwide. Proximal caries detection in primary teeth mainly rely on bitewing radiography. Initial lesion of proximal caries visible in a bitewing radiographs are difficult to detect and often missed by dentists. Recently, deep convolutional neural networks (CNNs) have a number of application in the area of medical imaging processing. The aim of this study is to evaluate the efficacy of deep CNN algorithms for detecting interproximal caries in primary teeth from bitewing radiography.

**Methods:** 500 bitewing radiographs were obtained from PACS system (Infinit PACS, Infinit Co., Seoul Korea) in Seoul National University Dental Hospital. The datasets were classified into training (80%), validation (20%). Additional 100 bitewing radiographs were used for test dataset. Pre-trained GoogLeNet Inception model was used for training and validating for optimal deep learning algorithm to detect proximal caries. The diagnostic accuracy, sensitivity, specificity, receiver operating characteristic curves (ROC) and areas under the curve (AUC) were assessed using test dataset.

**Results:** The CNN model for detection of proximal caries showed good diagnostic performance (AUC = 0.89, sensitivity = 0.78, specificity = 0.92). Diagnostic accuracy increased as the sample size in the increases.

**Conclusions:** This study demonstrated that proximal caries in primary teeth using bitewing radiographic image datasets are effectively detected and diagnosed based on the CNN algorithms. Further research is necessary for the dental diagnosis with deep learning architecture.

**Socioeconomic Characteristics and Food Habits Association with Dental Caries and Oral Hygiene Status in 10-14 year old Children**

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**Background:** Good oral health is important for overall development. Dental caries is a multifactorial disease that is the most prevalent among children all over the world. Oral hygiene habits and diet are important etiologic factors for caries. This study assessed the association of socioeconomic characteristics and food habits with dental caries and oral health.

**Method:** The study was conducted in a school, with permission of the principal and consent of the parents. Over two days, indices were recorded and questionnaires were distributed. 250 children aged between 10-14 years were examined and their OHI-S index and DMFT index (only permanent teeth were considered) were recorded. The given questionnaires had to be filled by parents and returned the next day.

**Results:** Out of 250, 234 children returned completed questionnaires. 38.0% had dental caries. The mean DMFT was 0.80 and mean OHI-S was 1.51. Only 23.9% children had visited a dentist. 96.2% children brushed their teeth regularly. The poor and lower income group had high prevalence of caries, the middle and higher income group had lower prevalence than the wealthy group due to dietary habit of consumption of more sugary foods by children of wealthy group. The effects of this high carbohydrate diet might not be as harmful to children as irregular oral hygiene maintenance. Children who brushed their teeth regularly had better oral hygiene and less number of decayed and filled teeth.

**Conclusion:** Socioeconomic factors, diet and oral health maintenance habits have a correlation with dental caries and oral hygiene status.

## Does the use of Potassium Iodide Reduce Dental Staining Caused by Silver Diamine Fluoride? A Randomized Clinical Trial

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**Background:** The Silver Diamine Fluoride (DFP-diamino fluoreto de prata) is an effective cariostatic resource in the control of caries, however it leads to the staining of the dental structure. Potassium iodide (IK) can assist in reducing this staining.

**Methods:** This randomized clinical trial was conducted with a total of 56 teeth with the presence of active caries randomly distributed into two groups: 30% Silver Diamine Fluoride and 30% Silver Diamine Fluoride associated with Potassium Iodide. The tooth staining evaluations followed a scale from 0 to 4 where 0 was white, 1 yellow, 2 light brown, 3 dark brown and 4 black. To discriminate the tooth score we used the computer program for Windows Paint. The teeth were reevaluated after one week, 15 days and 1 month to verify the inactivation of the treated caries lesions and the change in the coloration of these lesions. At the end of the treatment, the parents were asked about their satisfaction with the proposed treatment through a VAS scale. Analysis was performed using the SPSS software version 22.0 including frequency analysis and Pearson's chi-square test.

**Results:** There was a significant difference between treatments at 1 week ( $p < 0.001$ ), 15 days ( $p < 0.001$ ) and 1 month ( $p < 0.001$ ) favoring the combined use of Silver Diamino Fluoride with Potassium Iodide. In both treatments, caries lesions were inactivated, but the frequency was higher in the group treated with DFP+ IK ( $p = 0.05$ ), although this difference was not significant. Regarding parent's satisfaction with the proposed treatment, there was no difference between the two types of treatment ( $p = 0.214$ ).

**Conclusions:** The use of IK immediately after application of DFP may be effective to minimize dark staining of the dental surface. The association of IK with DFP did not interfere with the inactivation of carious lesions of the treated teeth, so both are effective. Parents were satisfied with both treatments received.



**The Influence of Deep Enamel Fluoridation on the Attitude of Infants on Home Oral Hygienic Care**

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**Background:** Despite the variety of available oral care products, it is quite difficult to organize regular tooth brushing for infants at home. Imperfect parental practical skills and age related developmental features of children make it impossible to obtain the desired result. The hypersensitivity, associated with the mechanical irritation from the toothbrush at the area of initial demineralization and superficial damage of the enamel of deciduous teeth may provoke a negative behavioral response. According to literature deep enamel fluoridation stimulates long term remineralization and decreases hypersensitivity due to formation of submicrocrystals (50 Å) of CaF<sub>2</sub> in damaged enamel after application of two liquids from product containing magnesium- and copper-hexafluorosilicate, sodium fluoride and calcium hydroxide and chemical reaction between them. The purpose of this study was to examine the influence of deep enamel fluoridation procedure on child`s behavior while toothbrushing at home.

**Methods:** The upper incisors in 1,5-2 years old patients with superficial caries lesions and a negative attitude to teeth brushing as reported in dental history, were cleaned and polished and the product for deep enamel fluoridation was applied according to manufacturer recommendations. Parents were asked to perform visual assessment of the rate of discomfort children felt when brushing their teeth using FLACC scale, daily one week before and one week after the deep enamel fluoridation procedure, and report the results.

**Results:** The behavior score "moderate pain" prevailed before the procedure. After procedure the results shifted towards the "mild discomfort zone" score.

**Conclusion:** Deep enamel fluoridation can improve child`s behavior while toothbrushing.

**Dentists` Perception of the Use of ICCMS™ in a Pragmatic Randomized Clinical Trial**

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**Background:** The International Classification and Management System of Caries (ICCMS) is a system developed through global evidence for standardization of caries diagnosis, risk assessment and treatment decision. The criteria of this system need to be evaluated in practice. For this reason a randomized clinical trial was conducted to assess the effectiveness of the system in preventing dental caries in a pragmatic study. The study also assessed the participants` perception with the use of the system as a secondary outcome.

**Methods:** This perception questionnaire was applied equally between the intervention group (ICCMS criteria) and the control group (professional criteria). The participating dentists were asked to answer online forms, through the platform Google Forms. These forms were composed of directed questions about the main occurrences and about their perception of performance. Moreover, there were open questions which were used to collect information about the positive and negative points about the intervention. Questionnaires were answered during the six months from the beginning of the study.

**Results:** Categories were created by content frequency analysis. The professionals who used the ICCMS reported more positive than control group, the ICCMS group indicated improvement in diagnosis, standardization of conducts, monitoring of patients and updating of knowledge. However, this group indicated one negative category more than the control group as the large number of patient absences.

**Conclusion:** Professionals who used the ICCMS had more positive perception than control group in their clinical outcomes as an improvement in the diagnosis and monitoring of patients.

**Factors Associated with the use of Dental Floss in Children 1-3 years**

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**Background:** The aim of this study was to evaluate the factors associated with the use of dental floss in children aged 1 to 3 years.

**Methods:** This cross-sectional study was conducted with a sample of 305 children aged 1 to 3 years living in the city of Diamantina, Minas Gerais. Data collection included the application of questionnaires to mothers addressing aspects related to maternal characteristics and habits, demographic factors and those related to child care. In addition, a clinical oral examination was carried out to assess the type of Baume`s arch, the presence of crowding and erupted teeth.

**Results:** The prevalence of flossing among the assessed children was 20.3%. The use of dental floss in children was associated with the presence of erupted posterior teeth (PR 1.25; 95% CI 1.17–1.35), the mothers` habit of flossing daily (PR 1.18; CI 95 % 1.06–1.31) and the child`s tooth brushing performed by the mother (PR 1.16; 95% CI 1.06–1.29).

**Conclusion:** Children whose mothers floss daily, whose mothers brush their teeth, and who already have at least one erupted posterior tooth, are more likely to floss.

Behaviour Guidance, Cariology and Preventive Dentistry

### **Analysis of Survey Responses Regarding an E-leaflet - Brushing and Diet Guide for Children during The COVID-19 Pandemic**

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**Background:** Covid-19 has led to a closure of many dental services, reducing the help and support for children and families. During COVID-19, many of the emergency calls were regarding children with a high caries risk. They were often:

- not registered with a dentist/thought their child was too young to see a dentist
- consuming a cariogenic diet
- not aware/motivated in maintaining good oral hygiene
- used to siblings having dental extractions due to caries

We were concerned that the decay rates for children may increase during the pandemic whilst children are at home and access to dentistry is limited. Our aim was to try target children with high caries risk by educating children and families in the form of an E-leaflet. The use of IT and technology has increased during the pandemic. Children are also familiar with E-learning.

#### **Method:**

1. Information gathering – assessed current information within the trust.
2. Using evidenced based literature to create the leaflet.
3. Leaflet design alongside an illustrator and approval process by clinical governance.
4. Online survey to obtain feedback.

**Results:** Positive feedback was gained, relating to its child-friendly layout and easy-to-read format.

**Conclusion:** The use of E-leaflet has been a successful method of information sharing, in a time where face-to-face appointments were not possible and postal services were delayed. This information is easy to return to and share with others.

Families now have baseline information to aid in behavioural change that can benefit the entire household. E-leaflets are a cost-effective resource.

**Comparative Evaluation of the Remineralisation potential of Theobromine and Fluoride Containing Dentifrices using Scanning Electron Microscopy with Energy Dispersive X-Ray Analysis: An in-vitro Study**

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**Background:** A greater understanding of the dental caries process and diverse methodologies to assess early demineralization and caries has enabled the development of a new class of remineralizing therapeutics. Hence, the focus of caries research is to manage non-cavitated carious lesions, noninvasively through remineralization to prevent caries progression. The aim of the study was to comparatively evaluate the remineralizing efficacy of Theobromine (Theodent™) and Fluoride containing dentifrice (Clinpro™).

**Methods:** 30 enamel specimens were prepared from freshly extracted premolars. The sections were coated with acid-resistant nail varnish leaving 2x2mm window on one side. The specimens were demineralized using acetate buffer solution (pH 4.2) and divided into three groups: Group I- Artificial saliva (control), Group II- Theodent™, Group III- Clinpro™. Each group was subjected to remineralization for a period of 20 and 40 days. Elemental analysis (Ca/P) was determined at baseline, after demineralization and remineralization using EDAX and structural analysis using SEM. The results were analyzed using one-way ANOVA, Tukey's HSD and Paired t-test.

**Results:** Theodent™ and Clinpro™ showed significant remineralization when compared to artificial saliva. Remineralization in each group was dose-dependent i.e. it increased with an increase in a time period. There was a significant difference (p0.05) in remineralization in the test groups compared to control. However, there was no significant difference between Theodent™ and Clinpro™ following remineralisation.

**Conclusion:** SEM- EDAX shows better remineralization in the test groups compared to the control group. Hence, Theobromine can be considered as a safer future alternative to Fluoride.

## **Relation between the Presence of Bacteria in Buccal Cavity and Caries Risk in Infants, Preschool and School Children**

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**Background:** In Chile, there has been an increase in dental caries during the child's first years of life. It is important to know both, the general and the oral risks to better apply prevention, treatment, and control the disease. The presence of bacteria in the oral cavity is an etiological factor of caries, but other parameters and habits that may influence this risk must also be considered.

**Methods:** The search was done between 2017 and 2020 in electronic databases such as PubMed, EBSCO, Epistemonikos and Cochrane Library, manual review in scientific journals and retrograde search. The following MeSH terms and keywords were used: "bacteria", "biofilm", "buccal microbiome", "microbiota", "microorganisms", "child", "children", "infant", "buccal cavity", "mouth", "caries risk", "dental caries", and boolean terms AND and OR. Articles in English, Spanish and Portuguese, published between 2000 and 2020, were reviewed, excluding in vitro studies and those carried out in patients with comorbidities or adults.

**Results:** The review included 596 articles, where nine met the inclusion criteria. The close relationship between bacteria and caries risk could be corroborated, but also other fundamental factors that define the risk are described, such as diet, general health, and oral health habits.

**Conclusion:** Although there is a relationship, the presence of cariogenic bacteria in the buccal cavity does not necessarily lead to caries development. Therefore, the orientation should not only be microbiological but focused on other influencing factors such as oral hygiene habits, sugar consumption, general health, family environment, and others.

**Risk Factors for Dental Caries in First Permanent Molars: A Prospective Cohort**

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**Background:** This study identified risk factors for dental caries in the first permanent molars in children.

**Methods:** A total of 122 pairs of mothers and children from Diamantina, Minas Gerais participated in a cross-sectional study in 2013 (children aged between 1 to 3 years) (T1). Socioeconomic data, children`s habits, toothache, visible biofilm, and dental caries were collected through the ICDAS (International Caries Detection and Assessment System). Three (T2) and six (T3) years after the first assessment, the children and their mothers were reevaluated. Data analysis included descriptive analyzes and Poisson Regression.

**Results:** The dental caries incidence in permanent first molars of 70.5% was observed. The presence of dental caries at T1 (RR = 1.41; 95% CI = 1.08-1.84) and T2 (RR = 1.58; 95% CI = 1.12-2.22) was associated with the incidence of dental caries in the permanent first molars, as well as the changes from T1 to T2 of the variables: toothache (RR = 1.44; 95% CI = 1.09-1.91), number of income dependents (RR = 1.66; 95% CI = 1.17-2.35) and tooth brushing frequency (RR = 1.77; 95% CI = 1.27-2.46).

**Conclusion:** Children who had dental caries at T1 or T2 and those who reported pain at T1 and T2 were more likely to develop dental caries in first permanent molars. Also, children with a lower frequency of tooth brushing and those who belonged to a family that remained with a higher number of income dependents had a higher risk of dental caries incidence in first permanent molars.

Cariology and Preventive Dentistry, Restorative Dentistry

### **Effect of Restorative Materials against Erosive and Abrasive Wear and their Influence on Adjacent Dental Enamel: An In Situ Study**

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**Background:** Erosive tooth wear may need dental restoration in case of pain or when function and aesthetics are compromised. The objective of this study was to evaluate the behavior of ionomeric materials (CIV), and composite resins (CR) with and without Giomer technology, considering the wear of the material and the adjacent enamel, when exposed to erosive/abrasive challenge.

**Methods:** This randomized, single-blind *in situ* study was conducted with 3 crossover phases of 5-day. Bovine enamel blocks (n=240) were allocated to 10 volunteers and 12 groups. The materials under study were: CR Beautiful II® (GB); CR Beautiful Bulk Restorative® (GBB); CR Filtek™ Z250XT (GF); CR Filtek™ Bulk Fill Flow® (GFB); CIV EQUIA® Forte (GE); CIV RIVA light-cure®(GR). Half of the enamel blocks were subjected to erosion and the other half to erosion plus abrasion. The restorative material was applied in artificial cavity following the manufacturer's instructions. The daily extraoral erosive attack consisted in 4 immersions in citric acid (2min); followed by abrasion with electric brush in half of blocks. The response variable was enamel and material loss by profilometry. Data were analyzed by three-way ANOVA and Tukey's test (p0.05).

**Results:** All materials suffered from wear, with GB=GBB=GF=GFBGE

**Conclusion:** The studied materials suffered higher wear when erosion was associated to abrasion, CR were less susceptible to wear and none of the materials had protected the adjacent enamel.



**Clinical and Radiological Evaluation of Amputation Therapy Applied to Permanent Molar Teeth**

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**Background:** CEM(Calcium Enriched Mixture) is a material whose clinical success has been proved with case reports in last recent years. This study aimed to compare its long term success with MTA and Ca(OH)<sub>2</sub>, which are the most used amputation materials.

**Methods:** Coronal amputation was performed on 60 permanent molar with irreversible pulpitis of 54 healthy children between the ages of 6-15 who were determined in accordance with power analysis. Zinc phosphate cement was placed on the amputation material, and as a final restoration, it was restored with composite/amalgam filling or stainless steel crowns. The successes of CEM, MTA and Ca(OH)<sub>2</sub> were compared in detail with clinical and radiographic controls performed 1,3,6,9 and 12 months. Clinically; the response to the electric pulp test, the presence of pain, ankylosis, percussion/palpation sensitivity, mobility or fistula, tooth discoloration, the state of the final restoration were evaluated. In periapical radiographs taken with parallel technique; pulp obliteration, internal/external root resorption increase/decrease in lamina dura width and root development were evaluated. Teeth meeting all criteria were considered successful.

**Results:** Of the teeth included in the study, 48 were with open and 12 with closed apex. At the 12 month check; the success rate is 84.21% in CEM Group, 78,26% in MTA Group, 66.7% in Ca(OH)<sub>2</sub> Group. The follow-up visits of the patients for 15,18, 24 and 36 months also continues.

**Conclusion:** In our study, we found CEM more successful in permanent tooth amputation, clinical and radiographic controls than existing materials.

**Use of Papacárie® in Chemical-Mechanical Treatment in Child Patients: Case Report**

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**Introduction:** To reduce the inconvenience of the conventional method of removing caries, a chemical and mechanical method was created to remove the deteriorated tissue, using a blue papain, chloramine and toluidine gel called Papacárie®, which works by smoothing only the carious dentin and facilitating removal, preserving healthy dental tissue. The present work describes the technique of using Papacárie® in the chemical-mechanical treatment of pediatric patients, demonstrating its use protocol.

**Case report:** Two patients, 5 and 7 years old, presented with caries lesions. After applying the gel, we waited 40 to 60 seconds for healing the infected tissue and then the cavity was washed with water. After chemical-mechanical removal of the decay, the teeth were restored with flow resin and glass ionomer cement.

**Discussion:** Conventional caries removal therapy increases the possibility of excessive cavity preparation, wears out healthy tissue, generates dental heating, stimulates pain, exerts pulp vibration, increases the chances of exposure and is considered noisy due to the use of high exercise speed. On the other hand, the technique in which Papacárie® is used does not require anesthesia and only the manual use of blunt curettes is necessary, which favors the preservation of healthy tissues and more comfortable patient care. In the present cases, the infected tissue was easily removed and the cavities sealed satisfactorily by the operator.

**Conclusion:** This therapeutic proposal proved to be efficient for these cases, showing the importance of alternative treatments to conventional ones in the removal of caries in the context of pediatric dentistry.

**Oral Health Attitude and Knowledge of The Primary Caregivers of Infants with High Caries Risk**

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**Background:** This study aimed to investigate the oral health attitude and knowledge of the primary caregivers of one-year-old infants with high caries risk in Hong Kong.

**Methods:** Infants aged one-year-old with high caries risk and their primary caregivers were recruited for an ongoing randomized controlled trial. A self-completed questionnaire was used to collect information about the caregivers' sociodemographic background, oral health attitude and knowledge at baseline.

**Results:** A total of 579 parent-infant dyads were recruited. The children were 12-16 months old. Over half of the caregivers (53.7%) did not have any previous oral health education. The caregivers' mean oral health attitude score (AS) for adult oral health care was  $7.0 \pm 1.0$  (Range: 3-8), and their mean AS for infant oral health care was  $9.1 \pm 2.0$  (Range: 1-13). Caregivers who claimed to have no oral health problem had a higher mean AS for adult oral health care ( $P=0.030$ ), and for the infant oral health care ( $P=0.014$ ). Only 16.2% of the caregivers knew how to brush their babies teeth correctly. One-third of them thought they could clean infants teeth when they were asleep.

**Conclusions:** Primary caregivers who had prior oral health knowledge showed a more positive oral attitude and were more willing to keep good oral hygiene for their infants. The oral health knowledge, in particular toothbrushing for infants, was inadequate. Oral health education should be introduced to the primary caregivers at an earlier stage so to improve infant oral health.

## How Influenced is Caries Lesion Progression by its Severity? – A Systematic Review and Network Meta-Analysis

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**Background:** To evaluate how some caries lesions patterns can have influence on caries progression to cavitations assessed into dentin (clinically) or, inner third of dentine (radiographically), using direct and indirect evidences (PROSPERO42017062388).

**Methods:** Longitudinal studies that evaluated caries progression in vivo and reported lesions severity in primary teeth were considered for analyses. To explore the influence of caries patterns on lesions progression, clinical lesion severity was classified in sound surfaces, initial, moderate and severe. Radiographic severity was categorized as no radiolucency, radiolucency into enamel dentin junction, and radiolucency into dentin. Risk of bias assessment was checked by New Castle Ottawa. Direct comparisons meta-analyses used inverse variance method and DerSimonian-Laird estimator for tau<sup>2</sup>. Indirect comparisons were estimate by Markov-Chain Monte Carlo simulations, and the effect measures were the Risk Relative (RR) with 95% confidence intervals. Fixed and random effects were chosen through comparison of competing models based on the Deviance Information Criteria. Heterogeneity was accessed with I<sup>2</sup>. Expected progression ranking was calculated.

**Results:** From 1.735 potentially eligible studies, 15 were selected. After 2-2.5 years, clinically initial lesions presented approximately 6-fold higher risk of progressing than sound surfaces (RR=5.6; 95% CI: 2.1-15.0; I<sup>2</sup>=11%) while, for moderate, increased to 19-fold progression risk (RR=19.0; 95% IC: 6.9-51.0; I<sup>2</sup>=11%). Radiographically enamel dentine junction presented lesions had an almost 3-fold higher risk of progressing than no radiolucency surface lesions (RR=2.9; 95% IC: 1.3-5.4; I<sup>2</sup>=16%). For caries in the outer half of dentine progression risk increased approximately to 4-fold (RR=3.9; 95% IC: 1.8-8.9; I<sup>2</sup>=16%).

**Conclusion:** Moderate lesions and caries radiographically involving dentine presented highest probability of progressing (98% and 85%) in 2-years. Caries severity, especially when assessed clinically, is related to higher progression rate and should be considered in caries diagnostic strategy.

**Effect of Trace Elements of Enamel in Primary Teeth and Caries Susceptibility**

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**Background:** Trace elements have been found to affect the solubility of enamel in primary teeth. Various studies have proved the effect of fluoride on enamel to have increased resistance to acid attack. Investigators have found a correlation between the amounts of aluminium, barium, copper, and zirconium in enamel to be not significant in caries process and a negative correlation was observed with strontium. The presence of certain other trace elements can affect the subsequent initiation of caries in the tooth. Therefore, by analyzing the human primary enamel, it could be possible to determine the chemical correlation between trace elements and caries formation.

The aim of this investigation was

1. To determine the trace elements present in carious and sound primary teeth.
2. To determine if special trace elements in the carious enamel might contribute to caries.

**Methods:** This study was done on 6 carious and 6 sound primary human teeth using energy dispersive x-ray fluorescence. The crowns were washed, dried, powdered and placed in a tray for analysis.

**Results:** 15 trace elements were found in these teeth. Calcium, phosphorous, zinc, potassium, strontium and copper were found in almost equal quantity in carious and sound teeth. However, titanium and sulphur were found in all the carious teeth, except one. Studies with titanium implants have found to cause erosion of bone. Sulphur, a soft element could be more susceptible to acid attack.

**Conclusions:** The presence of titanium and sulphur in primary carious teeth may increase their susceptibility to caries.

**Effectiveness of IgY in Preventing Risk of Dental Caries in Humans: Systematic Review**

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**Background:** Immunoglobulin Y (IgY) is an egg yolk derived antibody which targets specific infectious entities within the alimentary tract. There are apparently no systemic immune responses. Many researchers have reported the effectiveness of passive immunization against caries, in which specific antibodies against Mutans Streptococci are administered orally. IgY too has been found to reduce Streptococcus Mutans count; a surrogate outcome for reduction of dental caries. However, there is a lack of evidence to enable recommendation of IgY as a caries preventive agent. Hence, a systematic review was planned to evaluate the effectiveness of IgY in preventing risk of dental caries in humans.

**Methods:** An apriori protocol was prepared as per PRISMA guidelines. Literature search was performed using a predesigned protocol in all the standard databases like PubMed- Medline and Google scholar. Observational, case-control, cohort and randomized clinical trial conducted in humans with moderate or low risk of bias were assessed for performing qualitative synthesis.

**Results:** 12 studies were included in the systematic review. The majority of studies were lacking homogeneity in terms of design and outcome variable. Human studies were mostly observational with no randomized clinical trial done till date, though they found efficacy of IgY in reducing dental caries in humans.

**Conclusion:** There is a lack of well-designed studies and randomized clinical trial for establishing efficacy of IgY for prevention of dental caries.

**Uncovering Dental Apps as a Robust Weapon for Health Education**

Renuka D S

**Background:** Dental Caries is among the most prevalent diseases of childhood. Among 2-11 years aged children 41% had dental caries whereas among 6-19 years 42%, as given by the National Health and Nutrition Examination survey (1999-2000). Health education plays an important role in decreasing these numbers. Oral health education program in schools introduces to the oral functions and factors to prevent illness and promote oral health. So, educating children at a school level will promise better oral health.

The aim was to evaluate and compare the effectiveness of different health education methods to educate children among age of 8-12 years.

**Methods:** Study was done at a residential school among 8-12 year old comprising of 100 children who were at a higher risk poor oral health due to lack of health education. Their knowledge about oral health was assessed with a validated questionnaire. Then children who scored less than 25% were divided into two groups employing two different methods of health education.

Group A (n=23): Modelling

Group B (n=23): Dental apps

Post education knowledge was evaluated using the same validated questionnaire and results were analyzed using statistical analysis.

**Results:** The results were statistically significant. The dental apps were proven 24% more effective than Modelling.

**Conclusions:** Dental Apps were proven to be more effective in improvement of oral hygiene among 8-12 yr old children than Modelling.

**Dental Apps–A Payoff to Facelift School Oral Hygiene Programme**

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**Background:** Globally, around 80% of children attend elementary schools; Poor oral hygiene is highly prevalent in these children due to inadequate health education. Nonetheless, schools persist to be a vital setting for health education, efficiently reaching around 1 billion children worldwide.

Children from all ages, are habituated to mobile phones. This ubiquity offers mobile phones a logical means by which information about oral health could be obtained, thus promoting the child`s positive attitude towards oral healthcare.

Dental apps being software programme provoke an evidence based dental hygiene routine. A survey conducted in 2012; 59% showed dental apps would modify the manner in which health knowledge is sought. Also, it is estimated that 73% of children are mobile phone users, which could be leveraged for health education.

The aim was to compare the effectiveness of different health education methods; Individual approach and Dental apps to improve Oral Health among 8-12years.

**Methods:** The study was conducted at a residential school child among 8-12 years. Consent and assent were obtained. Pre-education scores were evaluated using validated Questionnaire. The children were divided into groups and taught about oral health care using individual approach and Dental Apps. Post-intervention scores were assessed on the Questionnaire. The data was subjected to statistical analysis.

**Results:** Dental Apps were proven to be 16% more effective in these children compared to Individual approach in increasing knowledge and attitude about oral hygiene.

**Conclusion:** Awareness raising health promotion strategies which includes this newer approach as a fundamental part of prevention of disease and control program in school is recommended.



**Feeding Practices as Precursor of Early Childhood Caries in Rural Population of the Vidarbha Region: A Cross Sectional Study**

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**Background:** Prolonged exposure of teeth to breastfed milk, bottle feeding and feeding at night have been identified as risk factors of early childhood caries (ECC).

**Methods:** A community study comprising of a group of 150 children within the age group of 1-3 years was planned. On attaining a written consent, the children's' mothers were interviewed based on a self-designed questionnaire (translated in local language: Marathi) regarding socio-demographic factors, feeding habits of child, oral hygiene practices of child. Intraoral examination was carried out using mouth mirror and WHO probe for assessing "deft" index. For this WHO oral health assessment form 1997 was used.

**Results:** 75% Bottle-fed children had dmft score 5 while 25% had dmft between 0-5. 68% of the children who were both breast and bottle-fed, had dmft score 5 while 32% had dmft between 0-5. 0.62% of the children who were breast fed for more than 6 months had dmft score 5 and 38% had score between 0-5. Out of 48% who were breast-fed for less than 6 months, 2% had score in between 0-5 and 77% had score 5.

**Conclusions:** Risk of ECC can be reduced by limiting the infant feeding for less than 12 months.

Cariology and Preventive Dentistry, Dental Anomalies

### **Caries Management in a Young Child with Learning Difficulties Complicated by Multiple Dental Anomalies**

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**Introduction:** Dental caries is the most common, preventable and non-communicable disease worldwide with dental caries affecting primary teeth ranked 12th in the World Health Organisation Global Burden of Disease Study. Dental morphological anomalies are recognised risk factors that can increase susceptibility to dental caries.

**Case Report:** An eleven-year-old boy was referred by his General Dental Practitioner to the Paediatric Department, University Dental Hospital of Manchester for specialist management of his failing dentition. Relevant medical history included learning difficulties with no reported familial inheritance. Clinical examination identified multiple retained roots, generalised plaque deposits and grossly carious primary and permanent teeth. Additionally, dental anomalies were identified including a talon cusp associated with the permanent maxillary lateral incisor, dens invaginatus on the mandibular premolar and erupted conical supernumerary tooth palatally positioned to the permanent central maxillary incisor. Management involved multiple extractions under general anaesthesia. High caries risk associated prevention was implemented including patient and parental guidance on adapted oral hygiene techniques for the dental anomalies.

**Discussion:** There is an increased prevalence of dental caries in children with learning difficulties. Dental anomalies, especially those affecting morphology, can cause plaque retention and predispose children to dental caries. Proactive and patient-specific preventative advice is necessary for risk mitigation. Moreover, inherited disorders where learning disabilities are one of many features need careful multi-disciplinary management if long-term craniofacial and/or dental development is compromised.

**Conclusions:** Dental anomalies can further increase dental caries risk hence patient and parent education should form a substantial component in prevention plans.

### **In Vivo Evaluation of the Efficacy of Antimicrobial Photodynamic Therapy (aPDT) against Oral Complex Biofilm**

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**Background:** Dental caries is one of the most prevalent diseases in children and prevention is the best treatment. Antimicrobial photodynamic therapy (aPDT) has been presented as an alternative treatment to bacterial diseases. The aim of this study was to evaluate the influence of aPDT against a complex and mature dental biofilm, analysing the reduction of the number of viable microorganisms present in oral biofilms.

**Methods:** 12 volunteers with the presence of complex biofilm over dental surface were selected. Each volunteer had 4 samples tested, divided randomly into two groups (irradiation with a Diode laser with 660 nm and 970 nm) and two subgroups (control/non-irradiated and irradiated). The biofilms were treated with methylene blue (MB) for five minutes and irradiated with the corresponding protocol. The negative control group received no treatment. After 7 days of incubation in anaerobic atmosphere at 37°C, the viability of microorganisms was analysed by the count of total microorganisms determined by colony-forming units (CFU) per milligram of biofilm. Statistical analysis was conducted by Wilcoxon-Mann-Whitney test ( $\alpha=5\%$ ) to analyse CFU/mg of a sample irradiated and a non-irradiated and the percentage reduction of microorganisms of each protocol tested.

**Results:** Both protocols reduced the viability of microorganisms, presenting similar results ( $p=0.0883$ ). The value of CFU/mg was statistically lower in both treatment groups in comparison with the negative control (970 nm,  $p = 0.002$ ; 660 nm,  $p=0.027$ ).

**Conclusions:** Therefore, the protocols of aPDT were effective in controlling the viability of a complex and mature dental biofilm.

### Prevention of Demineralization during Fixed Orthodontics: An umbrella review of Systematic Reviews

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**Background:** A well-conducted systematic review serves as a powerful platform for evidence-based healthcare that provides an unbiased comprehensive summary of the available literature; however, the conduction of systematic review is not free from caveats. The purpose of the present umbrella review is to appraise and summarize systematic reviews that have evaluated the prevention of enamel demineralization during multi-bracketed fixed orthodontic treatment, identify concerns in the review process, and assist clinicians in making evidence-based decisions.

**Methods:** Systematic reviews that have analyzed primary studies on the prevention of demineralization during multi-bracketed fixed orthodontic treatment were included. Seven electronic databases and grey literature were searched by two authors to identify potential articles. The risk of bias of the included reviews was assessed using the Risk of Bias in Systematic Reviews (ROBIS) tool by two authors independently and the degree of overlap was assessed by generating a citation matrix.

**Results:** After duplicate removal, 492 records were screened and 29 reviews were finally included for the present overview, 23 of these reviews were assessed to be of a high risk of overall bias, five of low risk and one review was of unclear risk of bias. Predominantly, the published reviews have focused on the role of fluorides, whereas some reviews have also studied the role of casein-phosphopeptide amorphous calcium phosphate, reminder therapy, lasers, and sealants in prevention of demineralization during multi-bracketed fixed orthodontic treatment.

**Conclusions:** The clinicians and researchers should be cautious about making their evidence-based decisions based on the reviews with a high risk of bias.

**Non-Nutritive Sucking Habits Associated with a Worsening of Preschoolers` Masticatory Performance**

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**Background:** Chewing is very important for children growth and development. The aim of this study was to evaluate the association of current nutritive and non-nutritive sucking habits with the masticatory performance (MP) in preschoolers.

**Methods:** A cross-sectional study comprising 384 children aged three to five years from public schools was carried out in Diamantina / Brazil. A single calibrated examiner performed all oral examination (Kappa 0.82). The presence of malocclusion was recorded using the Foster and Hamilton criteria. The number of masticatory units and the presence of cavitated caries in posterior teeth were also recorded. Parents answered a questionnaire addressing questions about the child`s current nutritive and non-nutritive sucking habits and also filled out a dietary recall to record food`s consistencies. The MP was evaluated using the Optocal test material and was based on the median particle size (X50). Data analysis involved simple and multiple Linear Regression, and the confidence level adopted was 95%.

**Results:** Multivariate linear regression showed an association between age (B = - 0.288; p = 0.026), pasty dietary consistency (B = -0.511; p 0.001), pacifier sucking (B = + 1,176; p = 0.026) and posterior cavitated caries.

**Conclusion:** Children who used a pacifier had a worse MP than those who had never used a pacifier, regardless of confounding variables.

**The Famous Five Keystones: Building Blocks of ICCMS**

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**Background:** The International Caries and Classification System (ICCMS) is a comprehensive set of clinical protocols that address all diagnostic, preventive and restorative decisions needed "to preserve tooth structure and restore only when indicated".

**Literature Review:** This comprehensive pathway of caries management provides various protocols to accommodate International Caries Detection and Assessment System (ICDAS) domains of clinical practice, dental education, research and public health. This powerful system consists of four-step structured process and leads to personalized intervention, specific to an individual's risks and needs. ICCMS emphasizes on prevention, controls initial lesions from progressing and restores with an aim of preserving maximum tooth structure. It allows anticipatory guidance possible, to parents and care-givers during the first dental visit of the child and in their review visits by delivering personalised holistic oral health care. The five key foundation components of ICCMS pathway includes, staging of the caries process, caries risk classification, the ICCMS decision matrices, ICCMS comprehensive patient management plan and the outcomes of caries management using ICCMS.

**Conclusion:** ICCMS treats caries as a disease and not as a lesion, giving importance to tooth preservation and based on the current evidences. This e-poster will highlight the five keystones that make this well-developed and documented protocols for implementation of a new model of caries management, popular.

**‘Calling all Health Visitors!’- Oral Health Promotion in the Under 5’s**

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**Background:** Health visitors are the first healthcare team to encounter families with new-borns and pre-school aged children in the community. Health visitors already provide oral health advice yet have infrequent training around this topic. This project aimed to evaluate and improve current oral health advice provided to children and families by health visitors covering three London boroughs; Lambeth, Southwark and Lewisham.

**Methods:** The oral health knowledge base of health visitors across these three areas was evaluated during a mandatory teaching session. Knowledge was assessed against the Delivering Better Oral Health national guidelines for prevention. Three questionnaires were formulated. Questionnaire 1 to establish baseline knowledge through seven short-answer questions. Questionnaire 2 completed after training to establish any improvement in knowledge. Questionnaire 3 determined learning needs and feedback. Sustainability of training was planned through recruiting a health visitor as a dedicated oral health champion.

**Results:** 22 health visitors attended the assessment and teaching session. 59% of health visitors were unsure of the maximum fluoride concentration for high caries risk children and half the staff were unsure of the most important time to brush a child’s teeth. A positive improvement was seen across all seven questions answered following the training.

**Conclusions:** Face-to-face teaching helped to improve health visitor’s knowledge of oral health advice for under 5’s. Health visitors showed interest in gaining additional resources for example guidance documents. Assigning an oral health champion amongst the health visiting team aided sustainability.

**Assessment of Anticariogenic Efficacy of Cranberry and Xylitol against Oral Bacteria**

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**Background:** Several plaque control agents with antimicrobial properties are available to inhibit plaque formation. Due to its various side effects, there has been a rising interest in naturally derived biologically active substances. Polyphenols present in the cranberry decreases the production of bacterial enzymes. The focus of the study is to evaluate the anti-cariogenic potential of the cranberry extracts on *S. Mutans*' biofilm compared to the similar effect of xylitol.

**Methods:** Unstimulated saliva was collected from a volunteer. After centrifugation, the saliva was placed in the wells of a 96-well microtiter plate and incubated for 2 hours. Overnight culture of *S. Mutans* was transferred to a BHI broth and grown at 37°C. The saliva treated wells were then seeded with bacterial inoculum along with cranberry-and xylitol solutions (test groups), and Chlorhexidine solutions (control), in each well and the plate was incubated for 24 hours. Biofilm formation was quantified using a spectrophotometer.

**Results:** MIC(minimal inhibitory concentrations) of cranberry i.e. 0.5mg/mL and 0.6mg/mL of xylitol, was taken as the final concentration to analyze the antibiofilm efficacy of cranberry and xylitol against biofilm of streptococcus mutans. 0.2% Chlorhexidine, being the positive control, showed 40.92% inhibition of biofilm formation, while 0.5mg/mL of cranberry showed 36.70% of inhibition and 0.6mg/mL of xylitol showed 34.19% of inhibition of biofilm formation.

**Conclusions:** This study concludes by stating that cranberry has proved to be a potent antimicrobial and antibiofilm agent and can be further developed as an effective and safe oral care product.



**Knowledge, Practice and Attitude of Parents towards Primary Dentition, Oral Hygiene Practices and Feeding Practices in Chennai, Tamilnadu, India**

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**Background:** Oral health plays a fundamental role in the overall general health, well-being and development of children. Millions of children today are unnecessarily affected by dental diseases because they cannot obtain timely preventive-, educational- or treatment services. The influence of parents are crucial in helping their children develop healthy oral habits early in life. Based on the burden of dental disease in children, a conclusion could be made that the parents lack the required knowledge about its causes and prevention. Thus this study was aimed to evaluate the knowledge, practice and attitude of parents towards primary dentition, oral hygiene practices and feeding practices within Chennai, Tamilnadu, India.

**Methods:** This cross-sectional questionnaire study was conducted among the parents of 500 children who reported to a dental institute. 20 Close ended questions were asked to parents with regards to primary dentition, oral hygiene and feeding practices. The responses that were received were tabulated and subjected to statistical analysis.

**Results:** 54.9% were aware about a specialty in dentistry that treats children only. 44.2% were aware that the primary teeth exfoliate and are replaced with permanent dentition. 39.1% felt that only on appearance of pain, the child should visit a dentist. 24.7% were aware of cleaning the gum pads regularly during pre-dentition stage.

**Conclusion:** Parents do lack the knowledge and awareness about oral hygiene practices and feeding practices towards their children. Sufficient training to gain knowledge on oral hygiene and feeding are needed to guide them in maintaining good oral health in children.

**Demineralizing Effect of Soft Drink and Remineralizing Potential of Pediatric Tooth Pastes on Primary enamel-A SEM Study**

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**Background:** Remineralisation potential of fluoride in incipient carious lesions has been well documented. However, this effect on enamel with acid erosion caused by soft drinks are not very encouraging. There has been a constant quest to find a fluoride alternative agent, which will be effective both against dental caries and dental erosion. Non-fluoride pastes containing calcium sucrose phosphate, CCPACP have been recommended due to their potential as a remineralising agent. The purpose of this study was to evaluate the demineralising potential of soft drink (Coca-Cola) on primary human enamel and to assess and compare the remineralising potential of two pediatric dentifrices using Environmental Scanning Electronic Microscopy (ESEM).

**Methods:** Enamel specimens (n=30) of non-carious primary central incisors were subjected to multiple demineralising cycles with Coca-Cola over 14 days. Twenty specimens were then subjected to the remineralising cycles (Toothpaste slurry) for 21 days using either fluoridated (n=10) or non-fluoridated (n=10) toothpastes. The de- or remineralisation status of enamel specimens were evaluated using a six scale scoring parameter (0-5), developed by Gupta et al., 1998.

**Results:** ESEM images revealed considerable amount of mineral loss by soft drink. Mineral recovery was achieved by both fluoridated and non-fluoridated toothpaste. However, enhanced surface smoothness was recorded in non-fluoridated paste compared to fluoridated one.

**Conclusion:** Non-fluoridated paste containing calcium sucrose phosphate produced greater enamel surface smoothness of demineralised enamel in vitro compared to a fluoridated paste.

### **Comparative Evaluation of the Remineralizing Effect of Dentifrices on Eroded Primary Teeth Enamel by Two Paediatric Liquid Medicament- A Scanning Electron Microscopic Study**

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**Background:** Dental erosion is a well-recognized problem that has apparently increased among the younger population in the last few decades. Erosion results from loss of mineral from tooth structure due to the chemical process of acidic dissolution not involving acids of bacterial plaque origin. Since enamel in primary teeth is porous and less calcified so it is easily dissolved by acids when compared to permanent teeth. Most of the paediatric liquid medicaments may contain inactive ingredients which can be harmful to the teeth. These medicaments not only contain sugary agents but also acids which are added as a buffering agent to improve flavour. Apart from the added benefit, these products have harmful effect associated like dental erosion. To prevent these different agents can be applied to minimise demineralization and promote remineralisation of tooth structure. So, the aim of this poster is to review the effect of paediatric liquid medicament as well as the effect of dentifrices on the eroded enamel surface.

#### **Literature Review:**

- 1) Mittal S, Singh BP, Sharma AK, Mittal K, Justa A, Vaid P. Surface changes of primary tooth enamel by commonly used pediatric liquid medicaments: A scanning electron microscope study. *J Pediatr Dent* 2017;5:14-20
- 2) Kapoor A, Indushekar KR, Saraf BG, Sheoran N, Sardana D. Comparative Evaluation of Remineralizing Potential of Three Pediatric Dentifrices. *Int J Clin Pediatr Dent* 2016;9(3):186-191.

**Conclusion:** The review concluded that the use of Paediatric liquid medicament has an adverse effect on tooth enamel i.e. Erosion which can be reduced by the use of dentifrices respectively as it decelerates the lesion progression with an added advantage of lower fluoride toxicity risk.

## **Management of Occlusal Dentinal Caries in Deciduous Mandibular Molars – A Clinical, Radiographic and Microbial Comparison of Three Techniques**

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**Background:** Management of occlusal caries remains a major challenge for researchers and clinicians with options ranging from complete surgical excision to the opposite extreme, where none of the carious tissue is removed and noninvasive methods are used to prevent progression of the lesion. The purpose of this study was to evaluate and compare efficacy of three minimally invasive techniques in healing and/or preventing progression of moderate to deep occlusal dentinal caries.

**Methods:** Sixty primary mandibular molars with caries extending upto middle 1/3rd to pulpal 1/3rd of dentin were selected from 45 cooperative children aged between 4-7 years and divided into three groups of 20 each as group 1: no caries removal and full coronal restoration, groups 2 & 3: selective caries removal to soft and firm dentin respectively and closed sandwich restoration. Caries risk, amount of remaining dentin and marginal integrity were recorded at baseline and 3-monthly follow up visits. Additionally, pulp vitality, signs and symptoms of infection were evaluated during the follow up visits. Child stress levels and parental satisfaction were recorded at baseline and 12th month follow up respectively.

**Results:** Stress levels and caries risk reduced statistically significantly in all the three groups. Significantly higher post treatment stress levels were seen in group 1 as compared to groups 2 & 3. Durability of restorations, amount of remaining dentin, absence of infection and parental satisfaction were significantly high and comparable in the three groups.

**Conclusions:** All the three techniques can be effectively used for management of deep occlusal caries.

**Influence of Breastfeeding Duration on the Incidence of Dental Caries in Preschoolers: A Cohort Study**

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**Background:** Investigate the association between breastfeeding duration and the incidence of severe caries in preschoolers.

**Methods:** A cohort study was conducted with 132 pairs of mothers and children in the city of Diamantina, Brazil. Data collection was performed in 2 moments: when the children were between two and three years of age (baseline) and after three years (T1). In both moments the children were evaluated for dental caries and a questionnaire was administered to the mothers addressing socioeconomic aspects and the habits of the children. The outcome evaluated was the incidence of severe caries (Dentin caries - ICDAS Codes 5 and 6). Data analysis involved descriptive statistics, chi-squared test and Poisson hierarchical regression with robust variance.

**Results:** Children who breastfed for more than 24 months (RR=2.25 CI: 1.24-4.08), those whose parents were separated (RR=1.74 CI: 1.12-2.69), those with established caries (RR=2.15 CI: 1.07-4.31) and those with severe caries (RR=2.75 CI: 1.37-5.49) at baseline were at greater risk of the incidence of severe caries after three years.

**Conclusion:** Breastfeeding for more than 24 months is a risk factor for the incidence of severe caries.

### Longitudinal Evaluation of Determinants of the Clinical Consequences of Untreated Dental Caries in Early Childhood

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**Background:** A large portion of children don't have access to the dentist, which favours its progression, resulting in clinical consequences, such as pulpal involvement and the development of mucosal lesions (ulceration, fistula, and abscess). Objectives: This study aimed to evaluate whether trajectory of family income, parental education and clinical variables, are associated with the presence of the clinical consequences of untreated dental caries among children.

**Methods:** A prospective cohort study was conducted with 439 children evaluated between one and three years of age at baseline and re-evaluated after three years. Sociodemographic and economic variables, dental caries and biofilm were investigated both baseline and follow-up. The pufa index (pulpal involvement, ulceration, fistula and abscess) was used to diagnose of the clinical consequences of untreated dental caries.

**Results:** The prevalence of  $pufa \geq 1$  was 18.2%. The following variables were associated with the presence of pufa: low mother's schooling at baseline and follow-up (RR= 1.51; 95% CI: 1.04-2.18), the incidence or presence of biofilm at baseline (RR= 4.66; 95% CI: 2.02-10.74) as well as cavitated dental caries at baseline (RR= 3.57; 95% CI: 1.86 to 6.83) and incidence of cavitated dental caries (RR= 2.04; 95% CI: 1.24-3.35).

**Conclusion:** Low mother's schooling, biofilm, cavitated dental caries at baseline, and the incidence of dental caries were determinants of the consequences of untreated dental caries.

**Obesity and Dental Caries: The Destruction Duo**

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**Background:** Childhood obesity and weight problems are two of the largest global problems of recent times in relation to child health. The World Health Organization (WHO) estimated that globally around 41 million children under the age of 5 years were either overweight or obese in 2016. However, this is definitely a preventable public health issue.

**Literature Review:** Many recent studies have demonstrated more than a coincidence between childhood obesity/weight issues and children suffering from dental caries. Alm et al (2011), Kay et al (2010), Marshall et al (2007), Zaror et al (2014) have proved in their studies that children who are overweight or obese are more likely to experience dental caries compared to children with normal weight. Studies by Davidson et al (2016), Bhoomika et al (2012) showed the reverse relation to be true. They found that children with dental caries had higher BMI than children with relatively better oral health. But it has also been hypothesized that children with obesity or who are overweight tend to have higher dental caries experience because they share certain common risk factors such as a high-sugar diet and low health literacy.

**Conclusions:** Thus, this literature review aims to establish a relation between childhood obesity and dental caries.

### **Esthetic Improvement of White Spot Lesions (WSLs) and Dental Fluorosis Using Resin Infiltration Technique in an Adolescent.**

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**Introduction:** White opacities due to early caries lesions and dental fluorosis may cause esthetic complaints to patients and its management represents a great challenge to clinicians. A micro-invasive technique with resin infiltration (RI) has been used to treat and prevent further progression of enamel caries lesions. Moreover it has been used as an alternative therapeutic approach to improve fluorotic opacities appearance. This case report aimed to evaluate the esthetic improvement of WSL and fluorosis opacities using RI technique.

**Case Report:** A 18-year-old female patient was referred to the Dental Clinic reporting complaint with teeth appearance. During clinical examination active WSLs were observed in the cervical area of the anterior and posterior teeth in both arches, associated with gingivitis. Symmetrical white opacities were also observed, diagnosed as moderate fluorosis. Considering the patient's age and the severity of the fluorosis a RI approach was indicated. After gingivitis management, the protocol of RI technique (ICON, DMG) was performed according to the manufacturer's instruction.

**Discussion:** The advantages of RI technique are to prevent caries progression and perform a Minimally Invasive Dentistry approach, obtaining satisfactory results by masking the white opacities immediately after its application. The limitation is related to the opacities characteristics and depth, which may not result in a complete and effective masking.

**Conclusion:** This case report demonstrates that the use of RI technique is an alternative of micro-invasive treatment to improve the esthetic appearance of WSLs and fluorotic opacities in an adolescent.



### Quality of Life Assessment of Children with Early Childhood Caries in a Brazilian City

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**Background:** Early childhood caries (ECC) is a sugar dependent disease with multifactorial modulating factors that affects primary dentition. The aim of the research was to investigate the impact of ECC on children`s quality of life and find out how it affects their routine, through a questionnaire applied to parents.

**Methods:** For this assessment, the Impact Scale on Oral Health in Early Childhood (ECOHIS) have been used. The sample consisted of 150 children aged 2 to 5 years enrolled in daycare centers and public schools in the municipality of Massapê-CE-Brazil. The questionnaire was answered by parents and guardians of children diagnosed with ECC. The analysis of the questionnaire was performed using SPSS software version 17.0 and R statistics 3.2.

**Results:** In the results, with regard to toothache and difficulty in eating and drinking, a prevalence of 85.48% was found with a statistical significance of 5%. 40.7% of family members considered themselves guilty at some level of intensity by ECC in children. Correlating family income with the financial impact of a dental problem and / or treatment, a prevalence of 96.35% was observed with a 95% confidence interval, demonstrating that the lower the family income, the greater the financial impact.

**Conclusions:** ECC interferes with the child`s quality of life, thus negatively affecting his routine, as well as that of his family.

**Remineralising Capacity of Natural Extracts in White Spot Lesions**

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**Background:** Enamel is the uniquely organized outermost covering of the tooth and is predisposed to numerous challenges within the oral environment. However, mature enamel cannot be regenerated due to lack of functional capacity of ameloblasts. Owing to this inherent limitation and any drop in pH below the critical value begins the demineralization process. Once a certain degree of demineralization has occurred the lesion will appear as white spot. Fluoride is a proven agent for caries prophylaxis but excessive use of fluoride may cause dental fluorosis if ingested by very young children. So there is a need for alternative prevention and treatment options that are safe, effective, and economical. Thus, instead of using Fluorides, artificial antibiotics and bactericides, it has been proposed that various medicinal plant extracts that have effects on bacteria causing tooth decay be used.

**Literature review:** Among natural food sources with antimicrobial activities, ginger rhizome (*Zingiber officinale* Roscoe, Zingiberaceae), rosemary (*Rosmarinus officinalis* L., Lamiaceae) Grape seed and Moringa species have been used as food spices and medicinal plants for centuries. Moreover, they are natural materials, showing no toxicity, and are considered 'generally recognized as safe' (GRAS) by the US Food and Drug Administration (FDA). In particular, their pungent oil components harbour a series of polyphenolic ketones with many pharmacological activities. Their antimicrobial effects on oral cavity pathogens have been reported in many studies

**Conclusion:**s Natural anticariogenic and remineralizing agents could find greater acceptability among the general public compared to fluoride-based systems

Cariology and Preventive Dentistry, Epidemiology

**To Investigate the Effect of use of ICDAS -2 and WHO + ECL Caries Detection Methods on the Prevalence of Dental Caries in Primary Teeth: A Pilot Study**

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**Background:** To investigate the effect of use of ICDAS -2 and WHO caries detection methods on the prevalence of dental caries in mixed dentition : A pilot study

**Methods:** 150 children in the age group of 6-12 years were examined twice using ICDAS-2 and WHO caries detection methods by two calibrated examiners. Average time taken to examine by both methods was noted.

**Results:** 10 children had a code of 00 in their dental surfaces. None of the individuals had any restorations or extraction due to dental caries. Good intra and inter examiner kappa co-efficient were obtained for both the methods. The average time to examine each patient using ICDAS -2 method was more than that of WHO method

**Conclusions:** The new system, ICDAS -2, provides more accurate information than WHO method for the investigators and epidemiologists.

### Accuracy of Telediagnosis of Dental Caries in Children: Systematic Review with Meta-Analysis

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**Background:** Our aim was to evaluate the accuracy of caries detection in children through images and remote consultations.

**Methods:** Medline (PubMed), SCOPUS and LILACS and OpenGrey were searched in July 2020 and articles were screened by 2 examiners. Eligibility criteria were: clinical studies on telediagnosis of caries in children, and clinical examination as the reference standard. The variables extracted were: Type of study, year of publication, sample size, means of telediagnosis, type of caries lesion, specificity and sensitivity data and prevalence of caries in the sample. The risk of bias was assessed using the QUADAS-2 tool. The pooled sensitivity and specificity, diagnostic odds ratio (DOR) and hierarquical Summary Receiver-Operating Characteristics curve were calculated using bivariate diagnostic random-effects meta-analysis.

**Results:** Of the 95 articles found 10 met the inclusion criteria.. The year of publication of the included articles ranged from 2007 to 2020. The number of children or teeth involved ranged from 15 to 291. With regard to the risk of bias, most studies were classified as low risk of bias, only 2 studies showed a high risk of bias. The meta-analysis was carried out with 5 articles that had computable data resulting in a pooled specificity of 0.83, pooled sensitivity of 0.89, area under curve of 0.92 and DOR of 36.67 for the telediagnosis of cavitated caries lesions.

**Conclusions:** Diagnostic evaluation through images seems to be a viable tool for the diagnosis of cavitated caries lesions, as measured by good sensitivity and specificity.

### **SEM Evaluation of Enamel Surface Changes Around Orthodontic Brackets after Application Fluoride Varnish: An In Vivo Study**

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**Background:** Because fixed orthodontic appliances provide a very favorable environment for the creation of white spot lesions, fluoride release has the greatest potential to protect the enamel in patients during orthodontic therapy. The aim of this study was to evaluate the effects of a topical fluoride varnish application on enamel around orthodontic brackets bonded with a composite resin.

**Methods:** The study involved 40 premolars extracted for orthodontic reasons. The patients were evaluated during a 30-day period and did not use any kind of fluoride supplement during the experimental period, except fluoridated toothpastes. Adhesive used in this study for bonding brackets was Con Tec LC (Dentaurum, Germany). After bracket bonding, the left premolars (test specimens) were kept dried by careful tooth isolation and the enamel received a single topical application of a fluoride varnish (Duraphat®, Germany) with the aid of a brush applicator. The right premolars were used as controls (i.e., did not receive any varnish application) and brackets were fixed using identical procedures. After 30 days, teeth were extracted carefully to avoid accidental brackets removal and stored in artificial saliva (20 mmol/l NaHCO<sub>3</sub>, 3 mmol/l NaH<sub>2</sub>PO<sub>4</sub> and 1 mmol/l CaCl<sub>2</sub>, neutral pH) until analyzing. After that, the samples (20 premolars) were prepared for scanning electron microscopy, SEM (JEOL JSM 5300). Determination of the fluoride in enamel (60 premolars) was done by spectrophotometer.

**Results:** Analysis of the results from this study on the level of fluoride in enamel before and after bonding the brackets with composite resin (Dentaurum, Germany), and application of a fluoride varnish clearly showed that after its application the level of fluoride in enamel significantly increased. Examination of enamel surfaces adjacent to orthodontic brackets revealed calcium fluoride - like material (CaF<sub>2</sub>) deposition as a reaction product of topical fluoride varnish application. An adhered thin layer of varnish was also seen in some teeth of the test group, which was in close contact with the enamel around the orthodontic brackets.

**Conclusions:** Fluoride varnish could be considered an efficient preventive method to enhance enamel resistance against the cariogenic challenges during orthodontic therapy. Thus, topical application of fluoride varnish on enamel adjacent to orthodontic accessories, incorporated as a routine clinical preventive procedure, represents a simple measure of great significance.

**Perception of Adolescent Pregnant Women about Baby Oral Health**

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**Background:** The primary care policy of SUS (Unified Health System) offers care directed to most vulnerable population groups, especially to pregnant teenagers. Dental guidelines should be included in the prenatal period, since women are p more receptive to acquiring new knowledge at this time. Access to dental care during pregnancy is fraught with barriers, ranging from the low perceived need of pregnant women, anxiety and fear of feeling pain, and difficulties in entering the public health service. This study evaluated the knowledge of pregnant teenagers about oral health and future oral baby care.

**Methods:** This quantitative study, involving pregnant women aged 13 to 18 years old, attending a referral unit for adolescent health in Belém-PA. Data were collected through a questionnaire and tabulated for further statistical analysis.

**Results:** 75% of pregnant women reported not having access to dental prenatal care, 28.57% said that breast milk is important as food, and 51.79% of them believe that it does not cause caries. 87.50% of them believe it is important to clean the baby`s mouth after each feeding and 35% affirm that the baby`s first consultation should be when the first tooth is born.

**Conclusions:** There was a deficiency in the knowledge of pregnant adolescents regarding their oral health and future baby oral care, showing the need for educational actions aimed at this group.

### Association between Sugar Consumption and Dental Caries in Preschoolers: A Cross-Sectional Study using the ICDAS Criteria

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**Background:** International Caries Detection and Assessment System (ICDAS) is a sensitive method to detect incipient lesions. This study aimed to investigate association between sugary consumption with dental caries, using the ICDAS criteria.

**Methods:** This is a cross-sectional study with Brazilian preschoolers, from 3 to 5 years old, attending a oral health program. Socioeconomic background, oral hygiene and dietary habits, classified as never, occasionally and usually, were collected. Two calibrated researchers performed the oral examination ( $k=0.73$ ). Chi-square test analyzed categorical data; Kruskal-Wallis and Mann-Whitney test analyzed continuous data ( $p < 0.05$ ).

**Results:** From 449 children, 121, 165 and 163 were 3, 4 and 5 years old, respectively. Age and ICDAS showed association; relative frequency of ICDAS=0 was higher at 3, than 4 and 5 years old (19.8% x 9.1% x 6.1%) and ICDAS $\geq 3$  at 5 years old (27.3% x 31.5% x 41.1%). Twice the frequency of ICDAS $\geq 3$  was observed in children whose mothers had less than 8 years of schooling (69.2 x 32.8). Visible biofilm was detected in 1(5%) children with ICDAS=0; 4(20%) children with ICDAS=1-2; and 15(75%) children with ICDAS $\geq 3$ . Decreasing frequency of ICDAS=0 was observed comparing never, occasional and usual consumption of: chocolate powder with milk (19.7% x 9.2% x 7.4), soda (15.6% x 7.3% x 5.0%), processed juice (14.6% x 10.5% x 5.1%) and processed chocolate milk (20.3 x 6.5 x 5.1).

**Conclusions:** The mother low education level, poor oral hygiene and diet with high frequency of sweet drinks were associated with dental caries in preschoolers.

**Antimicrobial Potential of Infant Mouthwashes on Planktonic Suspensions of Streptococcus mutans: An In Vitro Study**

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**Background:** Little is known about the antimicrobial potential of mouthwashes in Streptococcus mutans bacteria. The objective of this study was to investigate the antimicrobial effects of infant mouthwashes against those bacteria.

**Methods:** S. mutans strain was used to perform inhibition zones by agar diffusion test. Brain Heart Infusion (BHI) agar dishes were divided in quadrants: G1 – cetylperidinium chloride (Cepacol Teen®); G2 – xylitol and triclosan (Dentalclean Garfield®); G3 – Malva sylvestris, xylitol (Malvatrikids Jr®) and G4 - phosphate buffer saline (PBS). After adjustment of bacteria, an aliquot of each group was plated on the BHI agar and transferred to an atmosphere at 37°C for 48 hours to perform the inhibition zones measurements. The data was analyzed by one-way ANOVA for intergroup comparison ( $\alpha = 0.05$ ).

**Results:** Inhibition zones were verified only to G1 ( $10.82 \pm 2.13$ ) and G3 ( $12.75 \pm 1.04$ ). No significant statistical difference was verified between G1 and G3 ( $p = 0.287$ ) and G2 and G4 ( $p \geq 0.05$ ).

**Conclusion:** Despite of the beneficial effects of mouthwashes, a combination of xylitol and triclosan was not effective to control S. mutans growth in this in vitro condition. Additional restrictions to regulate the antimicrobial substances selling and further clarification should be provided to population.



**Caries Risk Factors of Early Childhood in 50 Preschoolers of the CD. DE Zacatecas School Cycle 2019-2020**

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**Background:** Dental Caries is a dynamic multifactorial disease that results from an imbalance in the biofilm driven by exposure to fermentable carbohydrates that over time can lead to the demineralization of dental hard tissues. Early Childhood Caries was known as bottle caries, but it has been shown that it is not only due to frequent bottle use, but also due to any natural or artificial sugary liquid.

**Methods:** It is a transactional, quantitative, descriptive study. In a sample of 50 children from 3 to 5 years old. Prior to informed consent, a dental examination was carried out, according to the WHO, a survey was provided to parents, in order to analyze hygiene factors, as well as the duration, content and frequency of bottle feeding.

**Results:** Of the 50 children selected, according to the survey carried out by parents, they indicated that 96% of children use a brush and toothpaste. In relation to the medicine they provide to the child, it was: a syrup of 28%, injection, suspension and dragees 20%, suspension 12%, drops 6%, suspension and drops and injection 4%, and 24% did not answer. Regarding the item, about the damage caused by the bottle, 80% knew that it is harmful, 12% did not know and 8% did not answer, if you sleep with a bottle in your mouth, 82% answered yes and 8% did not. . The content of the bottle; 50% sweetened it, 28% did not and 22% did not answer. Regarding the sweetener he used: 76% sugar, 20% sugar and honey and 4% honey.

**Conclusions:** Inform parents about the formation of cavities and the use of a bottle and / or sugary drinks while the child sleeps, the exposure time. Of the medications that are administered to children, a very high percentage are syrups and suspensions, of which these have a high degree of artificial sweeteners and will contribute in a way that Caries occurs in Early Childhood.

**Variation of Salivary pH by the Application of Ozonated oil O3MX®300IP, by Means of a Standardized Test Saliva-Check BUFFER GC®**

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**Background:** The study of saliva and the pH variation is being considered as the main factor for measuring risk of Severe Early Childhood Caries. Most of the articles published on the effects of ozone are based on its antimicrobial activity for oil pulling or ozonated water but the use of smeared ozonated oil has been little studied. The purpose of this article was to evaluate the effectiveness of therapy with ozonated olive oil O3MX®300IP in reducing salivary pH, to counteract the demineralization effect that occurs in an acidic environment and to aid in prevention.

**Methods:** Longitudinal and comparative study; It was carried out in a population of 13 adolescents aged 21 to 23 years who underwent 2 salivary pH measurements in stimulated saliva with Test II of the Saliva-Check BUFFER GC® Kit, a baseline measurement and after the manual application of O3MX®300IP. All sequence data were analysed using the MINITAB software suite.

**Results:** For the basal measurement the pH was of  $7.66 \pm 0.09$  and after the application of O3MX®300IP of  $7.27 \pm 0.19$  establishing a variation of  $0.28 \pm 0.48$   $t = 8.04$   $p = 0.000$ . From the investigation it is concluded that the correlation is significant and there is a decrease in salivary pH. The decrease in pH may be related to counteracting the demineralization effect and help in the prevention of caries risk.

**Conclusion:** The results were satisfactory taking into account that a single application was made with a contact time of 1 minute and with a peroxidation index of 300 mE / kgO<sub>2</sub> and in all cases there was a significant decrease in salivary pH.

**Assessment of Knowledge, Attitude, Practice and Clinical Decisions towards the Concept of Minimal Intervention Dentistry among Dental Practitioners in Khartoum State**

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**Background:** Minimally Invasive Dentistry (MID) is the most modern approach for the management of dental caries. There is no evidence that the familiarity with MID principles is translated into clinical decision-making and practice among dental practitioners in Khartoum state. This study was conducted to assess the knowledge, attitude, practice and clinical decisions of dental practitioners towards the concept of MID.

**Methods:** Data were collected through a modified version of a previously validated questionnaire from the college of dentistry, University of Iowa. It was tested for reliability. Among 2240 dentists satisfying the inclusion criteria, a sample of 295 DPs consisting of 195 general dental practitioners, 53 registrars and 47 specialists were selected randomly to fill the questionnaire. Data were analysed using statistical package of social sciences SPSS version 24.

**Results:** The results of this study have shown that almost all DPs had adequate knowledge (98%), only (65%) showed a positive attitude towards MID, which influenced their practice regarding use of new diagnostic aids and procedures of preventive dentistry. Training in MID and years of clinical experience have scientifically positive effects on clinical decisions ( $p$  value =0.00), and positive attitude towards MID is positively correlated to practitioners' practice of new diagnostic aids and procedures of preventive dentistry ( $p$  value =0.000).

**Conclusions:** Although most GDPs were found to have adequate knowledge about MID; however, this study showed deficiencies in their attitudes towards MID. Having Positive attitude towards MID, had positively affected DPs' use of new methods for caries detection and practice of preventive measures.

**Scardovia Wiggisiae: A New Frontier in Early Childhood Caries**

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**Background:** Dental caries is an infectious microbiologic disease of the calcified tissues of the teeth, characterized by demineralization of the inorganic portions and destruction of the organic portion of the tooth. Early childhood caries (ECC), is epidemic worldwide with 8.8%, global prevalence burden of untreated caries. The aim of the study was to evaluate the presence of *Scardovia wiggisiae* in children with early childhood caries by using polymerase chain reaction and compare and correlate the presence of *Streptococcus mutans* and *Scardovia wiggisiae* in children with and without early childhood caries.

**Methods:** A total of 88 samples were taken for study. The study subjects consisted of 44 children with early childhood caries with def score 5 or above and 44 children with def score 0 which served as the control group. Plaque samples were taken by the explorer method and placed in a 1.5ml test tube containing 1ml of sterile phosphate buffer solution, which was stored at 20 degree Celsius followed by DNA isolation and quantification. The quantified DNA underwent polymerase chain reaction to detect the presence of *Scardovia wiggisiae*.

**Results:** The data obtained was compiled for statistical analysis. Comparison between two groups was done by applying Mann–Whitney Test.  $p \leq 0.05$  was considered statistically significant. *Scardovia wiggisiae* demonstrated significantly higher median scores [Median= 30219.0] as compared to *Streptococcus mutans* [Median=4654.5 in ECC group. In the control group, *Streptococcus mutans* demonstrated significantly higher median score [Median= 2816.0] as compared to *Scardovia wiggisiae* [Median=1027.5] The ECC group had higher mean relative 16sRNA expression of *Scardovia wiggisiae* than the control group.

**Conclusions:** Within the limits of this study, it can be concluded that *S.wiggisiae* plays a major role in S-ECC and *S.mutans* could be a commensal and a causative factor in the initiation of caries. Further studies should be conducted to validate this along with the assessment of other underlying species which are probably play a role in development of caries.

**“Evaluation of Fluoride Uptake in and on to the Enamel Surface of Two different Warm Fluoride Varnishes”**

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**Background:** Dental caries is the most common disease of oral cavity. Fluoride (F) is an effective anti-caries agent when delivered in many vehicles and concentrations.

The aim was to compare the fluoride uptake in and on to the enamel surface of two different warm fluoride varnishes.

**Methods:** This in vitro study involves 96 tooth samples divided randomly n=48 each were allocated to two experimental groups. In group I, n=12 (Total n=48) enamel blocks were allocated each to four different temperatures (250C, 370C, 500C, 600C) and similarly (n=48) samples were allocated to four different temperatures for group II respectively. Fluor-Protector 0.7% fluoride varnish was allocated to experimental group I and Embrace 5% fluoride varnish was allocated to experiment group II.

The teeth were individually treated with fluoride varnish. The pH of varnishes was measured using pH paper.

After fluoride varnish application for all the specimens, two teeth from each temperature from group I and group II, a total of 16 teeth were mounted cylindrically and subjected for hard tissue microtome sectioning for SEM analysis. Remaining 80 teeth, 10 from each temperature of two groups were subjected for KOH-soluble and KOH-insoluble fluoride estimation respectively.

**Results:** Pair-wise comparison between different temperature groups for KOH Soluble and KOH insoluble fluoride showed statistical significant difference between FluroProtector and Embrace Fluoride varnishes

**Conclusions:** Topical fluoride varnishes are more effective by warming or even slightly increasing to body temperature. Thus, more uptake of fluoride in and on to the enamel surface for greater protection against dental caries.

**Effect of Toothpaste Containing CPP-ACP and Fluoride in the Prevention of Enamel Demineralization**

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**Background:** To evaluate the effect of fluoride- and CPP-ACP containing toothpaste on their ability to prevent enamel demineralization.

**Methods:** Freshly extracted human permanent molar teeth were obtained from the Department of Oral and Maxillofacial Surgery, Dental School, MU, Indore after prior permission from the institute. Enamel human specimens were assigned to the following groups: G1- (MI Paste ONE, 1100ppm F and 10% CPP-ACP (Casein PhosphoPeptide-Amorphous Calcium Phosphate), GC America Inc, USA); G2- 1450 ppm NaF toothpaste (Colgate Total) and G3-Control (deionized water). Enamel block of 3 x 3 x 2 mm was prepared from a flatter labial surface and embedded in epoxy resin. Superficial surface of enamel was ground flat with water-cooled carborundum discs and 1200 grit Waterproof Silicon Carbide Paper thereby removing about 200 µm of enamel. To produce demineralised lesions the samples are stored in acidic hydroxyethylcellulose (HEC, pH 4.8) for 3 days. One part of toothpaste and 3 parts of artificial saliva (9 g:27 ml) using a laboratory stand mixer until homogeneous. After the mixture is prepared, different toothpastes are exposed to each group's enamel surface by an applicator brush and left undisturbed for 2 minutes. A digital Micro Vickers Hardness Tester (Wilson Wolpert Europe BV, 401 MVD, Netherland) fitted with a Vickers diamond and a 200N load is used to make indentations in the enamel surface. Data is analysed using SPSS 20.0 software. ANOVA is used for surface microhardness recovery (%SMHR) among treatments. Repeated measures analysis of variance is used to assess statistical differences. The significant level (p) was set at 0.05

**Results:** The mean baseline surface microhardness value was similar for all treatment groups before demineralization (p =0.378). The mean SMHR % was found to be higher in the teeth treated with CPP-ACP + 1100 ppm Fluoride toothpaste ( $27.48 \pm 10.34$ ) than in the teeth treated with 1450 ppm NaF ( $22.89 \pm 13.18$ ) and this difference was statistically significant (p=0.000).

**Conclusions:** The CPP-ACP and 1100 ppm F containing toothpaste demonstrated having the most protective effect against demineralization.

**Changes in Salivary Electrolytic Dynamic after Sucrose Exposure in Children with Early Childhood Caries**

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**Background:** It is known that sucrose is able to promote changes in the salivary ionic dynamic of calcium ( $\text{Ca}^{2+}$ ), phosphate ( $\text{Pi}$ ) and fluoride ( $\text{F}^-$ ) in saliva of children with Early Childhood Caries (ECC). This study sought to explore changes in the salivary ionic dynamic of calcium ( $\text{Ca}^{2+}$ ), phosphate ( $\text{Pi}$ ) and fluoride ( $\text{F}^-$ ) in saliva of children with ECC after a 20% sucrose rinse (SR).

**Methods:** Here, sixty preschoolers aged 3 to 5 years were divided into 2 groups: caries-free (CF) and with ECC. Changes in saliva flow rate, pH and buffering capacity (BC), as well as in concentrations of  $\text{Ca}^{2+}$ ,  $\text{Pi}$ , and  $\text{F}^-$ , and the degree of saturation in relation to hydroxyapatite (DSS HAp) and fluorapatite (DSS FAp) were evaluated.

**Results:** A significant increase in  $[\text{Ca}^{2+}]$  was demonstrated after SR in CF group ( $p=0.05$ ).  $[\text{Pi}]$  was reduced by 18% after SR in ECC group ( $p=0.02$ ).  $[\text{F}^-]$  was reduced in both groups after SR ( $p<0.000$ ). There was a moderate positive correlation between  $[\text{Ca}^{2+}]$  and the DSS HAp and DSS FAp. Multivariate analysis showed that children with a higher  $[\text{Ca}^{2+}]$  in saliva are more likely to develop early childhood caries. The Receiver operating characteristic analysis, demonstrated that BC and  $[\text{Ca}^{2+}]$  in pre-rinse saliva have a discriminatory ability to identify sick individuals.

**Conclusions:** Sucrose rinse changes the salivary ionic dynamic of  $\text{Pi}$  and  $\text{F}^-$  in saliva of children with ECC. In addition, BC and  $[\text{Ca}^{2+}]$  can be considered a biomarker of ECC.

**Oral Health Habits and Dental Caries of Children with Osteogenesis Imperfecta**

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**Background:** To present oral hygiene habits and dental caries scheme in a group of children with osteogenesis imperfecta (OI).

**Methods:** Twenty-three patients 5-17 yrs (14 male) with OI completed a questionnaire and underwent clinical examination after obtaining informed consent. Clinical parameters registered were: DMFT, dmft, CPI, OHI. Oral health related habits included dental visits, tooth brushing, flossing, use of mouth rinses, consumption of sweets and sugary drinks. Descriptive statistics and Spearman correlation coefficient were used (statistical significance  $p \leq 0.05$ ).

**Results:** Mean age of the patients was 9.86 yrs, while caries-free were 35% for the primary and 39% for the permanent dentition. Mean dmft: 3.18 (SD: 4.03), DMFT: 2.65 (SD: 4.14), CPI:1.43 (SD: 0.5) and OHI:2.3 (SD: 0.76). Thirty percent visited the dentist rarely, 48% brushed once daily and most of them did not floss (87%) or mouth rinse (91%). Daily sweet consumption was reported by 39% of the patients, mostly between meals (78%), while 74% had no sugary drinks. Most affected teeth were 1st permanent molars, followed by 2nd bicuspid and 2nd primary molars, followed by the 1st ones. The least affected teeth were lower incisors for both dentitions. DMFT correlated with patients' age ( $p=0.006$ ) and consumption of sweets between meals was negatively correlated with brushing ( $p=0.001$ ) and flossing frequency ( $p=0.032$ ).

**Conclusions:** Dental caries and poor oral hygiene are common problems in patients with OI and therefore dental examination should be part of the full clinical evaluation. Proper daily habits must be reinforced to maintain good oral health.



**" Grapple before they Trample"- Relative Analysis of Potential Efficacy in Remineralisation of Primary Tooth Enamel by Non-fluoridated Dentifrices: An Invitro Study**

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**Background:** S-ECC major oral health concern globally. This has led to major change in lifestyle and customs of people; modernization brought lot changes in daily routine leading to increase in rates. This caries process has a continuum from first dynamic changes in hydroxyapatite crystals to visible white-spot lesion. This brings a need to prevent hydroxyapatite from modifying its structure. For years fluorides have been used for caries prevention. The major shortcoming is ability of enamel remineralisation, limited by the low concentration of calcium and phosphate ions in saliva. The current study used non-fluoridated materials that provide additional ions in the oral environment for remineralisation and also avoid fluoride toxicity in infants/toddlers, thus supporting the concept of PREVENTION than RESTORATION.

**Methods:** 30 therapeutically extracted primary maxillary central incisors were sterilised and stored in artificial saliva until processed. After grouping into group-I(n=10) Toothmin, group II(n=10) negative control and group-III(n=10) Enafix, samples were subjected to cyclic demineralisation and remineralisation (with respective agents once every 24hours for 10days). Each sample was grounded separately, to estimate calcium and phosphorous weight percentage using EDX beam technique and confirmed by SEM.

**Results:** The weight percentage of calcium-phosphate in hydroxyapatite estimated higher in the Enafix than Toothmin indicates; Enafix shows higher remineralisation in given time, because of its action of substantivity and anti-plaque adherence.

**Conclusions:** Comparing results, even though there is no much statistical deviation, Enafix has better hydroxyapatites than Toothmin. The crystals are formed at a higher rate in Enafix, though not similar to the natural enamel prism in the tooth.

## Systematic Review of Behavioural Intervention Studies of School-based Toothbrushing Program with Theoretical Domains Framework

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**Background:** Supervised toothbrushing with 1000 ppm fluoride toothpaste is the key behaviour in reducing children's carious prevalence. Elementary schools provide an ideal setting where children can develop this healthy behaviour by designed behavioural interventions. According to the Cochrane review published by Cooper et al., there is insufficient evidence for primary school-based behavioural interventions to reduce caries. The potential challenges of synthesizing the literature were: difference of the intervention design in each study, multifactorial nature of human behaviour, and different environmental context in these countries. Designing behavioural interventions requires exploring the behavioural changing components. Theoretical Domains Framework (TDF), which was designed by Michie et al., is a comprehensive framework to explain behavioural change. The aim of the study is to identify the components in school-based behavioural interventions by Theoretical Domains Framework (TDF).

**Literature Review:** The TDF was used to analyze the published trials of behavioral interventions in elementary schools (children aged 6 to 12). We followed the search strategy in the Cooper's Cochrane review. Included studies were modified to randomised controlled trials, non-randomised controlled trials and pre-post studies. This review included 53 studies of school-based behavioural intervention, with a total 79 interventions in these studies.

**Conclusions:** Four to six domains are most often used in these papers, and the "Knowledge" domain was the most frequently adopted. No single specific domain or a set of domains can determine the success of behavioural interventions. Hence, choosing domains during designing a future program should depend on the local context or resources.

### Photodynamic Antimicrobial Chemotherapy Reduces Early Colonizers Microorganisms from the Oral Biofilm

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**Background:** Due to the cariogenic potential of early colonizing microorganisms, it is important to evaluate alternatives for their reduction with innovative approaches. This study tested the effect of PACT on the oral biofilm formed with early colonizing microorganisms using the association of photosensitizer methylene blue with  $\beta$ -cyclodextrin nanoparticles and laser or LED on red light spectrum ( $\lambda = 660 \text{ nm}$ ).

**Methods:** Multispecies biofilm composed of *S. oralis*, *S. mitis*, *S. sanguinis* and *S. gordonii*, grown in 48-well plates containing BHI supplemented with 1% sucrose (w/v) for 24h were divided into groups (n=6, in triplicate): C- (negative control, 0.9% NaCl), CX (positive control, 0.2% chlorhexidine), L (Laser), LED, P (Photosensitizer/Nanoparticle), LP (Laser + Photosensitizer/Nanoparticle) and LEDP (LED+Photosensitizer/Nanoparticle). Lasers at 9J for 113s (323J/cm<sup>2</sup>) or LED (light emitting diode) at 8.1J for 90s (8.1J/cm<sup>2</sup>) were used to conduct the light irradiations. Viable biofilm microorganism counting was performed before and after the treatments in selective culture media to assess the microorganisms' reduction. Data normality was assessed by the Shapiro-Wilk test and the results were submitted to Kruskal-Wallis analysis, followed by Dunn's test ( $\alpha=0.05$ ).

**Results:** LP and LEDP groups reduced the biofilm microorganisms' counts as they significantly differed from the negative control group and did not statistically differ from the positive control group.

**Conclusions:** PACT mediated by methylene blue conjugated to  $\beta$ -cyclodextrin irradiated with LASER or LED reduced multispecies biofilm composed of early colonizing microorganisms.

**Anxiety previous to Dental Treatment in Patients with Molar-incisor Hypomineralization**

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**Background:** Children who have teeth affected by molar-incisor hypomineralization (MIH) are often submitted to dental retreatments, and they may be at greater risk of developing anxiety during these procedures. The objective of this clinical study is to assess whether the clinical condition of patients with teeth affected by MIH may be associated with anxiety during dental treatment.

**Methods:** This preliminary analysis is part of a larger study on the prevention of post-eruptive breakdown and dental caries in teeth with MIH. 69 children (6 to 10 years) who presented different degrees of severity of MIH in at least one permanent first molar were included. The Children's Fear Survey Schedule-Dental Subscale questionnaire was applied before dental treatment started by a team member who didn't participate in the initial clinical inclusion assessment. Multilevel Poisson regression to assess the severity of the injury on anxiety and other independent variables were calculated ( $\alpha=5\%$ ).

**Results:** It was possible to observe that 25% of the children were not afraid of anesthesia. There was a positive association regarding the severity of the injury and the anxiety presented by the child ( $p < 0.01$ ). In addition, boys were more anxious than girls before dental treatment and children who had previously had dental consultations due to pain or sensitivity were also more anxious ( $p < 0.01$ ).

**Conclusion:** It was possible to conclude that children who had at least one permanent molar with MIH involving dentin were anxious for dental treatment compared to children who had only enamel defects.

### **Case Report of a Young Patient with Dental Trauma in the Higher Central Incisives and 12 years of Monitoring**

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**Introduction:** The restoration of a harmonic smile after dental trauma is a challenge for restorative dentistry. The aim of this study is to report a clinical case in which a young patient had traumatized upper central incisors and was followed up for 12 years.

**Case report:** A 9-year-old male patient attended the Odontopediatrics clinic of “Academia cearense de Odontologia” for emergency care, after trauma and endodontic treatment in elements 11 and 21. Because it was an extensive fracture, treatment with fixed prostheses was indicated, but after clinical and radiographic evaluation, it was decided to perform restorative treatment with composite resin. Only at the age of 19, the patient sought the clinic again and presented a complaint of diastema between the traumatized teeth and a change in the color of these elements, leaving the composite resin more evident. Dental bleaching was performed in the office, followed by the exchange of composite resins. At the age of 21, in the clinical follow-up, dental whitening treatment was performed and the resins remained intact.

**Discussion:** Dental trauma occurs commonly in the general population, which is why it is present in dental offices. The aesthetic rehabilitation treatment can be carried out with composite resins or fixed prostheses, a correct diagnosis of which technique and which materials are most suitable for each clinical situation is essential in this choice.

**Conclusion:** The reported case was solved by performing the aesthetic techniques with photopolymerizable composite resins. These restorations are minimally invasive procedures, which provide good aesthetics and restore function.

**Save the Sixes – The First Permanent Molars: Review**

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**Background:** The first permanent molar (FPM) plays an essential role in the masticatory function by contributing to the implementation and the maintenance of the occlusion. However, it is considered as the most frequently affected and the earliest affected tooth by caries. To ensure that any early carious lesion is intercepted. Therefore, making it essential to take all the necessary special precautions to save it in the oral cavity.

**Literature Review:** The FPM helps in maintaining the occlusal morphology, distribution of masticatory forces and arch perimeter. According to a study conducted by Phipps KR, Stevens VJ (1995) periodontal disease is the main cause of loss of permanent molar. The FPM, due to its period of mineralization coinciding with early childhood diseases, can erupt with a structural abnormality. Molar incisor hypomineralisation (MIH) is considered to be the most common defect observed on the first permanent molars among children. 7.9% of children were affected with MIH. About 84.7% of the children had the four molars affected. Children with MIH had a significantly higher prevalence of caries: 78.8 versus 33.5%. These structural abnormalities of the enamel must be corrected out earlier to ensure that the coronary anatomy is the least compromised. The consequences of losing the first permanent molar are severe. Such as severe mesial tipping of the second permanent molar, supra-eruption or over eruption of the antagonist first permanent molar and migration or distal tipping of the second premolar.

**Conclusions:** Etiology, prevalence and consequences associated with the FPM makes it of high importance requiring special attention from day one as it is the first permanent tooth to erupt. All necessary preventive measures should be directed towards saving the six in the oral cavity from the time of eruption.

## The Association between Prescription Frequency of Probiotics and Caries Experience-- A Taiwan's National Health Insurance Research Database Study

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**Background:** In-vitro studies and clinical trials had suggested that probiotic therapy has the potential effect of preventing dental caries. Taiwan National Health Insurance offered payment for six brands of probiotics during 1995-2008, including Vitabutyrimin tablet, Niulackmin tablet, Vioment tablet, Lac-B granular powder, Biofermin R powder, and Antibiohilus capsule. Most of those probiotic medicines were prescribed by pediatricians. Those records can be traced by analyzing Taiwan's National Health Insurance DataBase (NHIDB). The aim was to investigate the association between prescription frequency of probiotics and caries experience among preschool children.

**Methods:** Retrospective cohort studies were conducted by using the records of Taiwan's NHIDB. Studied subjects were children born in 2000. Four different groups were defined according to frequency of probiotics prescription during age 0-6. Between these four groups, demographic data and complexity of dental caries treatment experience were compared with Chi-square tests. The complexity of dental caries treatment experience was defined according to the frequency of primary tooth filling treatments and pulp therapies.

**Results:** According to the presenting database study, prescription frequency of probiotics has a positive correlation with caries treatment utilization, with significant difference (p0.001). We were unable to prove these six probiotics covered by Taiwan National Health Insurance have the effect of decreasing dental caries in children. Furthermore, groups with higher frequency of probiotics prescription have more complex caries treatment experience.

**Conclusions:** Within the limitations of database study, using probiotics medicine according to the practice routine in pediatrics could not help decreasing dental caries among preschool children.

**Beyond the Silver Lining - Panacea to SDF Discoloration: An In-Vitro Study**

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**Background:** Silver Diamine Fluoride (SDF) is a cost effective and non-invasive material that can be applied to arrest caries in deciduous and permanent teeth. It inhibits demineralization and increases surface micro-hardness of teeth. However, the major drawback is discoloration of tooth structure, which limits its' clinical use due to aesthetic concerns. Application of potassium iodide (KI) after SDF has been considered as one of the methods that can overcome the discoloration issue. An alternative method has been developed which may decrease staining by mixing glutathione (GSH) with SDF. The aim of this study was to evaluate and compare the effect of KI and GSH on tooth discoloration after application of SDF in primary molars.

**Methods:** 30 primary molars were randomly divided into three groups of 10 each. Teeth were prepared and divided into Group A – SDF only, Group B – SDF followed by application of KI and Group C – SDF mixed with GSH. Final restoration was done using glass ionomer cement. Visual examination and color assessments using spectrophotometer were recorded at three different time intervals.

**Results:** Statistical analysis was done using a repeated measures ANOVA test. The spectrophotometer results showed that Group A (SDF) exhibited the greatest amount of discoloration at all time intervals, while Group C (SDF + GSH) group was effective in decreasing the discoloration. Group B (SDF+KI) significantly reduced the discoloration over the period of time. (p=0.008)

**Conclusions:** KI can effectively reduce discoloration after application of 38% SDF. GSH can also be used as an alternative.



**Stain-free Smile: The Tournament of Tooth Care: An Invitro Study**

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**Background:** Routinely prescribed iron formulations in children have documented black staining on primary teeth. These stains are easily removed in a dental setup using a prophylactic paste. Nowadays, a wide range of dentifrices for stain removal are available. Hence this study compared the efficacy of prophylactic paste with three dentifrices for iron stain removal in primary teeth.

**Method:** Sixty extracted primary anterior teeth were decoronated, followed by filling the pulp chamber with flowable composite. The teeth were then immersed in ferrous sulfate solution and pre-intervention digital images were obtained. Teeth were divided into four groups wherein the first group was subjected to iron stain removal using prophylactic paste (Group A). The remaining three groups were subjected to electric tooth brushing using Colgate® Visible White (Group B), Himalaya® Sparkling White (Group C) and Biomed® Superwhite (Group D) dentifrices. Post-intervention digital images were obtained and color parameter differences were evaluated using image color summarizer software.

**Results:** Significant differences between color parameters were obtained for Group A, B and C ( $p \leq 0.05$ ). Intergroup comparison of  $\Delta E$  revealed significant differences between groups A ( $p \leq 0.05$ ) and group B, C and D respectively.

**Conclusion:** The use of prophylactic paste in primary teeth remains the best method for iron stain removal. Although newer dentifrices for stain removal are available they are not as efficient as prophylactic paste.

**The Use of Silver Diamine Fluoride for Delaying Definitive Dental Treatment in Indonesian Children**

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**Introduction:** Untreated early childhood caries (ECC) in Indonesian children is very common. Untreated ECC greatly affects children's quality of life. Failure to meet the basic needs of children could lead to disturbance in children's growth and development. Many pediatric dentists in Indonesia face great challenges to manage untreated ECC. Silver Diamine Fluoride (SDF) has unique properties that could remineralize teeth structure, arrest dental caries, and delay definitive dental treatment that could potentially lead to dental phobia in children. The purpose of this case report is to document the use of SDF as an effective option for delaying definitive dental treatment in Indonesian children.

**Case Report:** A few cases of untreated ECC was treated with SDF. Ages ranged from a 1-year-old baby to a 10-year old child. The follow up treatment range varied from 1 week, 2 weeks to 1 month, according to children's scheduling visit.

**Discussion:** The main advantage of using SDF for delaying definitive dental treatment in children is that the paediatric dentist could effectively arrest dental caries progression by applying SDF in the existing carious lesions, while delivering information regarding upcoming definitive dental treatment. Good communication and preparation between the paediatric dentist, parents, and pediatric patient is a solid foundation for a successful pediatric dental treatment outcome.

**Conclusion:** The use of silver diamine fluoride is considered as minimally invasive and cost effective in delaying definitive dental treatment among Indonesian children.

### **Comparative Evaluation of pH Changes of Probiotic and Chlorhexidine Mouthwash in Children: Short Term Clinical Study**

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**Background:** Dental caries is the most common chronic oral disease that affects 60–90% of young population. It is multifactorial in nature. Dietary counseling and proper oral hygiene habits are required for its control. Recently, various economical and efficacious agents have been tried out in combating dental caries. Probiotic technology represents a breakthrough approach to maintain oral health by utilizing natural beneficial bacteria commonly found in healthy mouths to provide a natural defense. The purpose of this study was to evaluate and compare the effect of Probiotic mouthwash and Chlorhexidine containing mouthwash (MW) on salivary pH.

**Methods:** The study was conducted among 40 healthy school children aged between 6-12 years. The subjects who fulfilled the inclusion criteria were selected and randomly divided into 2 groups: Group A(20 children – Probiotic MW) and Group B(20 children – Chlorhexidine MW). 2 ml of unstimulated saliva samples were collected, and the baseline pH was assessed using a pH meter. Salivary pH was evaluated immediately after the rinse and then after 15 and 30 minutes, respectively. The statistical analysis was done using the SPSS software version 20.0, using the unpaired t-test.

**Result:** From the present study, it was observed that in the probiotic mouth rinse group, salivary pH was increased compared to baseline. There was statistically a significant difference between the Probiotic mouthwash and the Chlorhexidine gluconate mouthwash.

**Conclusion:** The Probiotic mouth rinse obviously has a potential therapeutic value and further long-term study is recommended to determine its efficacy.

**The Silver Standard: The Rise of Silver Diamine Fluoride use in the UK?**

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**Background:** The state of children's oral health in the UK continues to be a growing concern; it has been reported that dental extractions under general anesthetic (GA) are the leading cause for hospital admission for children aged 5-9 years.

Internationally, SDF has been used extensively in the prevention and arrest of caries for over 80 years, yet it is not routinely used in the UK.

**Literature review:** Numerous studies report SDF as being significantly more effective in arresting and preventing caries in deciduous teeth, when compared to fluoride varnish (sodium fluoride), which is commonly used in the UK. The results in permanent teeth remain somewhat inconclusive, where some authors report resin or glass-ionomer sealants as superior.

There appears to be a wide margin of safety with SDF use for caries management. Some studies have noted no adverse pulpal changes when used in deep carious lesions and therefore may be of use for indirect pulp-capping treatment; however, this has not been widely studied.

Potential side effects have been reported, including discoloration; although in posterior teeth, this is less of a concern for patients.

**Conclusion:** SDF is a safe and effective non-invasive treatment modality for dental caries in children that can minimize the need for GA. In the current climate, with limited GA services available and minimally invasive treatment encouraged, SDF is likely to be used "off-label" for the foreseeable future. It is therefore vital that clinicians are aware of any ethical and legal implications of its use to aid informed consent.

**Radiographic Control of Occlusal Caries in Primary Molars after Selective Removal of Dentine: Randomized Clinical Trial**

Edite Novais Pinchemel, Marcone Rocha, Ana Flávia Calvo, Kelly Maria Moreira, Tamara Tedesco, Taís Gimenez, Isabela Floriano, José Carlos Imparato Imparato  
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**Background:** Dental caries are an important public health problem that impacts child wellbeing. Currently, disease control, while still in the dentin cavitation phase, is based on the selective removal of dentin protocol. Based on this, this study evaluated and compared the effectiveness of different glass ionomer cements in caries progression after selective removal of decayed dentin.

**Methods:** A randomized multicenter clinical trial (CEP-1.432.851/CAAE 52569515.1.0000.5374) was performed, using the cost of two glass ionomers as an independent variable. The sample group consisted of children aged 4 to 9 with dentin carious lesion on the occlusal surface of primary teeth (total n = 86), which was subsequently randomized into a control group (Fuji IX/ n = 43) and a test group (Maxxion R/ n= 43). Caries progression was assessed using radiographic control, 6 and 12 months after restoration. The data were compared using Fisher's Exact Test (Bioestat, version. 5.3, Instituto Mamirauá, Amazonas, Brazil).

**Results:** Caries progression was not observed with radiographic supervision after 6 months in either group (p = 1.0). On the other hand, two primary teeth in the test group showed caries progression with radiographic control after 12 months, but there was no statistical difference between the groups (p = 0.2857).

**Conclusions:** The results showed no differences between the restorative materials, regarding the progression of caries in deciduous molars in the present study.

### **Digital Periapical Radiography versus Visual Caries Classification System in the Detection of Proximal Caries Extent in Primary Teeth: A Diagnostic Accuracy Study**

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**Background:** Periapical digital radiography is most commonly used in pediatric dentistry. Nevertheless, it has shown mediocre sensitivity and specificity in the detection of proximal caries. Evidence regarding the accuracy of periapical radiography in detecting the extent of interproximal caries through enamel and dentin is sparse. Thus, this clinical study aims to assess the accuracy of digital periapical radiography versus visual inspection following occlusal molar reduction under general anaesthesia.

**Methods:** Periapical digital radiography was taken of fifty primary molars before operative work under general anaesthesia. The radiographs were standardized using Renn XCP on the same machine (MyRay, Italy) exposure variables. One operator performed occlusal reduction only for the primary molars till half the occlusogingival height. The molars were then photographed using a Nikon 7200 professional camera where the interproximal area is perpendicular to the camera lens. Interproximal caries extent was classified visually and radiographically to zones E1, E2, D1 and D2 and score will be 0,1,2,3 and 4. Two examiners blindly assessed the carious extent both on photographs and radiographs. Inter-rater reliability was evaluated by the interclass coefficient (ICC), and conflicts between examiners were resolved by consensus.

**Results:** This study included 100 proximal surfaces of primary molars. The inter examiner reliability was excellent ( $\kappa = 0.92$ ). Sensitivity and specificity of periapical radiography was calculated for different carious extent in enamel and dentin. Sensitivity and specificity of intact proximal surfaces was 57% and 75.5%. For the outer and inner enamel halves, sensitivity and specificity were 22.2% , 86.8% and 6.6%, 92.9% respectively. Finally, the outer and inner dentine halves, sensitivity and specificity were 33.3%, 89.7% and 60%, 86% respectively.

**Conclusion:** In primary molars, early diagnosis of proximal enamel non cavitated carious lesions is not reliable using digital radiography periapical X-rays.

### **Modification of Smile`S Perception after Aesthetic and Functional Rehabilitation in a Patient with Severe Childhood Caries**

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**Introduction:** Early Childhood Caries (ECC) is a multifactorial disease that affects children in the preschool phase, and its most aggressive form is called Severe Childhood Caries (SCC). The present study aimed to describe the clinical case of aesthetic and functional rehabilitation of a 4-year-old male patient affected by SCC.

**Case report:** A resin rehabilitation was performed on the upper anterior teeth using the “Styleitalian technique”. This is an excellent technique for pediatric dentists who wish to produce simplified and excellent aesthetic dentistry. This is accomplished by using specific Styleitaliano spatulas, mainly the Misura spatula that measures 0.5 mm for the last enamel layer. Basically, the technique uses 2 different opacity resins from Filtek™ Z350 XT. The sequence of the technique starts by placing enamel resin on the palatal side and then the dentin shade, using the Misura spatula. The 0.5 mm gap was measured and finished with enamel resin. In the posterior teeth, restorations with resin were performed using the direct technique as well. Guidance on the importance of good eating and hygiene habits was enforced.

**Discussion:** The proposed treatment restored the chewing function and aesthetics of the smile. The child and his family were very satisfied with the result.

**Conclusion:** The rehabilitation treatment with direct restorative techniques and resins in children affected by ECC disease, is efficacious in obtaining a satisfactory aesthetic result and to promote oral health and general well-being for the patient and his family.

**Comparative Assessment of Antimicrobial activities of *Tinospora cordifolia* and *Ocimum tenuiflorum*: An invitro study**

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**Background:** Oral lesions are common chronic diseases that affect the general population, especially children. The application of traditional medicinal plants and their products for treatment has been an integral part of our culture and continues to play a key role as many of the infectious microorganisms are resistant to synthetic drugs. It has become a major concern all over the world. In ayurvedic medicine, *Ocimum sanctum* & *Tinospora cardifolia* are the medicinal herbs that have importance in modern research due to their large number of medicinal properties. These herbs have shown antimicrobial, anti-inflammatory, analgesic, antipyretic, and anticancer activity without any side effects. The extracts of these herbs are used as a remedy for many diseases. Considering the efficiency of herbal extracts, the present study was undertaken to assess antimicrobial activities against *Streptococcus mutans* & *Candida albicans*.

**Methods:** The hydroalcoholic extract of these two herbs were tested against *Streptococcus mutans* & *Candida albicans* using the agar well diffusion method. The zones of inhibition were measured, and data were tabulated. The antimicrobial activity of the two herbs was compared using the Mann Whitney test.

**Results:** The zones of inhibition obtained for the herb *Tinospora cardifolia* was significantly greater compared to *Ocimum tenuiflorum* for the organism *Streptococcus mutans*. However, there was no statistically significant difference among the two herbs for *Candida albicans*.

**Conclusions:** The reported findings from the study suggest that the herbal extracts of *Tinospora cardifolia* and *Ocimum sanctum* have better potential to enhance their antimicrobial capacity against two different organisms.



**Oral Health and Juvenile Idiopathic Arthritis**

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**Background:** Juvenile idiopathic arthritis (JIA) is the most common autoimmune inflammatory disease of connective tissue in children, affecting around 1 in 1000 children under the age of 16 years. The prevalence of JIA is estimated to affect 60,000 children under 16 years of age in Europe. The incidence is 7000 new cases every year. Despite the high incidence and prevalence of JIA, there are limited number of studies reporting on the medical condition of the oral cavity of children with JIA.

**Literature review:** In previous studies, the age range of children and adolescents with JIA was from 2 to 20 years. Studies have been carried out on oral health in children and adolescents with juvenile idiopathic arthritis issues such as dental caries, oral hygiene, periodontal disease, enamel defects, temporomandibular involvement, temporomandibular disorders, and oral ulcerations.

**Conclusions:** Based on the literature review, periodontal diseases and temporomandibular disorders were more common in JIA compared with healthy peers. Although, documentation of reduced oral health related quality of life due to oral diseases is rare, it has been reported that children and adolescents with TMJ arthritis, may experience reductions in abilities, resulting in reduced oral health-related quality of life. Individuals with JIA require special attention to maintaining oral health. Further studies are needed for understanding effects of JIA on oral health.

**Comparing the Effect Of 38% Silver Diamine Fluoride on Shear Bond Strength of Two Different Luting Cements to Caries Affected Dentin in Primary Posterior Teeth**

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**Background:** The advancement in concepts surrounding the caries process gives the pediatric dentists the capability to practice minimally invasive dentistry. SDF and Hall crowns have been the game-changers, that may be employed together or separately in caries management. The purpose of this study is to compare SDF's effect on shear bond strength (SBS) of Glass Ionomer Luting Cement (GIC) and Resin Modified Glass Ionomer Luting Cement (RMGIC) on carious dentin of primary posterior teeth.

**Methods:** Forty extracted primary posterior carious teeth were randomly assigned into four groups of ten each. Group 1: Caries with GIC. Group 2: Caries with RMGIC. Group 3: SDF with GIC. Group 4: SDF with RMGIC. 2mm buttons of GIC (Ketac) and RMGIC (Rely-X) were bonded onto dentin substrate. Instron 5566A was used to test SBS with 1K load cell and crosshead speed of 1mm/minute. Descriptive analysis and Two-way ANOVA with Tukey's HSD for post-hoc analysis was done.

**Results:** In decreasing order, mean  $\pm$  standard deviation of SBS values: Caries with RMGIC:  $1.34 \pm 0.32$  MPa. SDF with GIC:  $1.15 \pm 0.42$  MPa. Caries with GIC:  $0.88 \pm 0.25$  MPa. SDF with RMGIC:  $0.81 \pm 0.39$  MPa. There was a significant difference between SBS of RMGIC and GIC in the absence of SDF ( $P = .0324$ ). There was a significant difference in RMGIC's SBS on SDF treated dentin versus untreated carious dentin ( $P = .0101$ ).

**Conclusion:** On primary posterior teeth, pre-treatment of carious dentin with SDF negatively impacts bond strength of RMGI luting cements, but positively impacts bond strength of GI luting cements.

### **Comparative Evaluation of Retention, Cariostatic Effect and Discoloration of Two Resin based Pit and Fissure Sealants in Primary Molars**

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**Background:** Dental caries is a preventable disease of the mineralized tissue of the teeth with a multifactorial etiology. A conference paper of the American Academy of Pediatric Dentistry, Pediatric Restorative Dentistry Consensus Conference in 2002 strictly recommends the use of sealing material. Cost effectiveness and decreased risk of caries up to nine times are some of the potential advantages of placing pit and fissure sealants. Resin based sealants are the material of choice but because of their hydrophilic nature and inability to be used in moist environment, their use is clinically limited

**Methods:** Two resin-based pit and fissure sealants Ultra seal XT Hydro and Biocoat was evaluated clinically on the criteria of retention, cariostatic effect and discoloration. A total of 80 children aged 4-9 years was divided into two groups,

Group 1: received Ultraseal XT Hydro

Group 2: received Premier Biocoat.

The patients were recalled at regular intervals of 3 and 6 months and evaluation of both the sealants was done on the basis of Deerey et al and WHO criteria

**Results:** On evaluation at 3 and 6 months both the sealants showed full coverage retention, excellent cariostatic effect and no discoloration. No significant difference was observed among both the groups

**Conclusion:** Ultraseal XT Hydro and Premier Biocoat reduce the need for proper isolation as a major criterion for retention which is a challenge in pediatric cases. Full coverage retention, excellent cariostatic effect and no discoloration was observed in both the groups. No significant difference was observed amongst both the groups.

**Caries Free Generation: A Myth or Fact..???**

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**Background:** Dental caries is an ever-growing public health problem and not enough is accomplished by existing preventive measures. It is thus prudent to address dental caries before its onset by reducing the number of mutans streptococci bacteria in the mouth, which is the main etiologic agent.

Experiments demonstrating the effect of active immunization have come a standstill in the current scenario. Newer approaches focus on the usage of passive immunotherapy and may become more important than active immunization. Evidence is also accumulating on the effectiveness of egg yolk antibodies for use in passive immunization.

**Literature review:** 1) Sa V. Nguyen, DVM, PhD; Faustino C. Icatlo Jr, DVM, PhD et al evaluated the suppressive effects of lozenges containing egg yolk antibodies (Ig Y) against *Streptococcus mutans* cell associated glucosyl transferase (CA- GTF), on oral colonization of mutans streptococci in healthy young individuals.

2) C.Gandhimathi and A.Michael evaluated the effectiveness of a mouth rinse containing chicken egg yolk antibodies generated against the whole cell antigen and cell associated glucosyltransferase enzyme (CA-GTF) of *Streptococcus mutans*, in preventing recolonization of *S.mutans* in dental plaque of human volunteers.

**Conclusion:** The treatment with egg yolk antibodies in children during window of infectivity and during secondary dentition may be very effective in preventing the colonization of streptococcus mutans in biofilm and thus dental caries. Due to its effectiveness, convenience, high yield, high specificity and possibility of large-scale production, it is considered as an ideal alternative to other antibodies.

**SDF with Potassium Iodide: Aesthetic or Effective**

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**Background:** Silver diamine fluoride (SDF) is vastly supported as a promising agent for its effectiveness and applicability in managing caries lesions. However, SDF-related irreversible black staining in aesthetic regions of the dentition is of particular concern for patients and parents.

**Literature review:** To alleviate this undesired effect and increase patient acceptance, several studies have suggested applying supersaturated solutions of potassium iodide (KI) as a second step after SDF treatment. This 2-step procedure has shown little to no darkening, compared to SDF alone or when used with restorative materials on both carious and sound teeth. Curing light can be used to ensure that the KI application over SDF has been successful because of the photosensitivity of silver ions. The caries arresting efficacy of SDF is not affected, or minimally affected by this additive treatment. It has also been reported that the pre-treatment of dentine with SDF followed by KI application showed reduced nano-leakage at the resin-dentin interface, without reducing the bond strength of resin composite to dentin. In another study, SDF-KI combination has shown least micro-leakage with a drastic increase in the bond strength of RM-GIC. However, if not protected, KI application can initiate desquamation of the oral soft tissues.

**Conclusion:** SDF with KI treatment is a promising possibility that can be used in patients where aesthetics is the prime concern. However, more long-term studies comparing the properties of SDF+KI with SDF alone are needed to establish its universal usage over time.

### **Comparative Evaluation of the Staining Potential of Silver Diamine Fluoride with Potassium Iodide and Glutathione: An Ex Vivo Study**

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**Background:** Early childhood caries is one of the most prevalent chronic diseases worldwide. Due to their young age and uncooperative behavior, restorative treatment for children is challenging. Silver Diamine Fluoride (SDF) is a cost-effective, easy-to-use alternative to reduce sensitization and arrest caries. There can be a shift from the surgical management of caries, “the drill and fill technique” to medical management with SDF. The major side effect of SDF is the staining of lesions. The staining potential of SDF may be modified by the application of Potassium Iodide (KI) and Glutathione (GSH). The purpose of this study was to compare and evaluate the effect of Potassium Iodide and Glutathione on the reduction of discoloration of carious lesions after application of 38% SDF on primary teeth.

**Methods:** An ex vivo study was done in extracted primary teeth with caries. The samples were divided into three groups. SDF was applied in the first group. SDF followed by KI was applied in the second group and SDF followed by GSH in the third group. The color change was evaluated using standardized time lapse photography and ImageJ software.

**Result:** The staining potential of SDF was modified by KI and GSH.

**Conclusion:** GSH and KI has an effect in decreasing tooth color changes after application of SDF.

**Silver Diamine Fluoride - Extending the Spectrum of Preventive Dentistry: A Literature Review**

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**Background:** Dental caries is an irreversible, chemical dissolution of dental hard tissues caused by organic acids produced by microorganisms. Although there has been a decrease in the prevalence of dental caries over the past few decades, it is still a severe oral health problem. Its impact in terms of pain, impairment of function, and oral health-related quality of life is high. Nowadays, caries management philosophy has changed from the traditional surgical approach to a medical model, which includes the use of fluoride therapy and antimicrobial agents like silver compounds. Among these agents, Silver Diamine Fluoride (SDF) is drawing much attention.

**Literature review:** The use of SDF to arrest dental caries was pioneered by Dr Nishino and Dr Yamaga in Japan. They described its effects for prevention and arrest of dental caries, prevention of secondary caries, and desensitization of hypersensitive dentin. Since then, many clinical trials and systematic reviews have established SDF's effectiveness to arrest and prevent caries in both primary and permanent teeth. In 2014, the US Food and Drug Administration approved SDF for dentin desensitization in adults. In 2017, the American Academy of Paediatric Dentistry has published a guideline for the use of SDF for dental caries management in children and adolescents.

**Conclusion:** When used wisely SDF can prevent the development of new caries and is a safe, effective, and minimally invasive treatment option to treat caries. The current review is an insight into the clinical significance and application of SDF based on published literature.

## **Manganese and Copper Levels in Mixed Unstimulated Saliva of 12-14 year old Children and its Correlation with Dental Caries**

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**Background:** Dental caries is a multifactorial oral disease that that universally but unevenly affects the world population. Apart from the main etiologic factors, “contributing” factors also play a role in the disease process. One such factor are the trace elements present in the saliva. Research in dentistry has been so much focused towards “fluoride” that there has been an almost virtual exclusion of consideration of other trace elements. Copper and manganese are among the essential trace elements present in saliva and have been associated with dental caries, although the results have been inconsistent. The present study was undertaken to evaluate the correlation, if any, between the manganese and copper levels in whole unstimulated saliva and dental caries in children

**Methods:** This cross sectional, analytical study was done among 12-14 year-old children. Oral examination was performed, and subjects were categorized into high caries group (DEFT 5), and low caries group (DEFT 2). 30 subjects were recruited in each group. Estimation of copper and manganese levels in saliva was performed by Atomic Absorption Spectrophotometer.

**Results:** Statistically significant difference was found in mean salivary copper levels for low ( $0.52 \pm 0.02$  mg/l) and high caries category ( $0.34 \pm 0.07$ mg/l). The mean salivary manganese concentration was higher in high caries group ( $0.32 \pm 0.02$  mg/l) as compared to the lower caries group ( $0.28 \pm 0.00$  mg/l).

**Conclusions:** Within the constraintof this study, it can be concluded that salivary copper showed an inverse relation while salivary manganese showed a positive correlation with dental caries.



### Can Firmicutes and Bacteroidetes Levels in the Mouth Reflect the Gut Condition in Obese Children with Early Childhood Caries?

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**Background:** This research investigated if Firmicutes and Bacteroides levels in the mouth were capable to reflect the gut condition considering obese children with early childhood caries (ECC).

**Methods:** Eighty preschoolers were assigned into the following groups: 1. Eutrophic with ECC (n=20) 2. Obese with ECC (n=20), 3. Eutrophic and caries-free (n=20), 4. Obese and caries-free (n=20). Obesity was assessed by the World Health Organization criteria (WHO) and ECC by WHO criteria plus the early caries lesions detection. Dental plaque and stool samples were collected for bacterial phyla quantification using real time PCR analysis. Data were assessed by three-way-analysis of variance and Pearson`s correlation ( $\alpha=5\%$ ).

**Results:** For Firmicutes levels, there was a significant effect of ECC that was not influenced by the anatomical location (mouth and gut samples;  $p<0.05$ ). Pairwise comparisons demonstrated higher values for Firmicutes in the obese children with ECC compared with those that were obese and caries-free in both mouth and gut ( $p<0.05$ ). While a negative correlation between Firmicutes in these two sites was reported in the obese children with ECC ( $p<0.05$ ,  $r=-0.48$ ) the opposite was found in obese children with CF ( $p<0.05$ ,  $r=0.50$ ). For Bacteroidetes, the effect of ECC ( $p<0.05$ ) was influenced by the anatomical location and in this phylum levels tend to be higher in the mouth of the obese children with ECC ( $p<0.05$ ).

**Conclusions:** This pioneer research suggested that numbers of oral Firmicutes reflected corresponding amounts in the gut of obese preschoolers with ECC.

**Minimally Invasive Dentistry - The New Normal**

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**Background:** Dental caries belongs to a group of diseases that are considered “complex” or “multifactorial,” [Fejerskov, 2004] and has profound effects in individuals of both paediatric as well as adult age groups. It is rightly recognized as a major public health concern globally. The purpose of this review is to focus on the concepts of minimally invasive dentistry that may seem simple but have a major impact in the prevention of this infectious disease in the long run. Also aims to acquaint the readers with the concepts of ecological approaches for caries prevention.

**Literature review:** Emergence of newer concepts of caries etiology, mechanism of progression and remineralization have greatly influenced modalities for caries management. The authors describe the basis for early diagnosis, modification in cavity preparation, techniques, and material selection. Various ecological approaches are also highlighted that show significant positive results in caries prevention aspect.

**Conclusion:** Minimally invasive dentistry is based on advances in dental materials as well as newer techniques. In combination with various ecological approaches, the upcoming methods show great promise for primary prevention of dental caries.

**Prebiotics and Probiotics: Newer Avenues in Dental Caries Management**

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**Background:** Dental caries is a dynamic, biofilm mediated, diet modulated, non-communicable disease caused by an interplay of various biological, behavioral, psychosocial, and environmental factors resulting in mineral loss of the tooth. Recent modalities of caries management put emphasis on manipulating oral microflora and modulating the host immune responses. In cariology, prebiotics are alkali generating substances like urea and arginine, that are selectively utilized by the resident microflora, generating ammonia which raises the pH. Probiotics are live microorganisms like Lactobacilli and Bifidobacterium which when administered benefits the host.

**Literature review:** Various studies in both adult and pediatric population has reported arginine as a prebiotic, to have an inhibitory effect on caries. The first attempt in understanding probiotics in the inhibition of *Streptococcus mutans* was by Meurman in 1995. An invitro study by Solderling demonstrated the ability of *Lactobacillus rhamnosus* in inhibiting *S mutans* in children. Another clinical trial by Kogler proved that consumption of ice cream containing *Bifidobacterium lactis* significantly reduced *S mutans*. In a systematic review by Cagetti (2013), daily intake of probiotics reduces salivary and plaque *S mutans*.

**Conclusion:** There is increasing evidence that prebiotic and probiotic supplements can diminish the caries incidence in high risk group children. However, more studies are required to confirm their use as beneficial and cost effective. A combination of prebiotic arginine with probiotic arginolytics may be the future symbiotic approach to caries care. This E poster focus on the role of pre- and probiotics in caries management as well as future directions in this field.

### **Combined Effect of Starch and Sucrose on Carbonic Anhydrase VI Activity in Saliva and Biofilm of Children with Early Childhood Caries**

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**Background:** Early studies have shown the enhanced caries-inducing properties of sucrose and starch combination in experimental and clinical situations. This study aimed to investigate whether combined exposure to starch and sucrose modifies the activity of carbonic anhydrase VI (CA VI) in saliva (Study 1) and biofilm (Study 2) of children with early childhood caries (ECC).

**Methods:** For Study 1 and Study 2, respectively, 54 and 46 preschoolers aged 4 to 5 were allocated into two groups: caries-free (CF) and with ECC. Children were exposed to rinses with sucrose, starch, and sucrose plus starch solutions. CA VI activity, pH, and buffering capacity (BC) were evaluated in saliva and biofilm.

**Results:** In Study 1, a significant reduction in saliva pH was observed after sucrose and sucrose plus starch rinses. CA VI activity was influenced by ECC independently of the type of carbohydrate to which children were exposed. CA VI activity was higher in children with ECC; however, after rinses, CA VI activity was reduced. In Study 2, biofilm pH and BC were reduced after rinses with sucrose and sucrose plus starch. CA VI activity was significantly higher before rinsing in ECC group when compared with CF group; however, no difference was observed between groups after rinses.

**Conclusions:** Saliva, exposure to starch and sucrose (isolated or combined) induced a reduction in CA VI activity in children with ECC. In biofilm, the combination of starch and sucrose did not modify CA VI activity in ECC children.

**Evaluation of Parents towards Perception of Importance of First Permanent Molar in their Children**

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**Background:** The First Permanent Molar (FPM) plays an important role in mastication, growth and development of the jaws and occlusion. Parental unawareness regarding the importance of the FPM may lead to its early carious involvement. This study was conducted to evaluate the parental perception of importance of FPM in children.

**Methods:** 380 parents completed a questionnaire in English or their local language. The questions assessed the knowledge of parents about type of dentitions, chronology of teeth exfoliation, home oral care, management of carious FPM and importance of FPM. The responses were tabulated and assessed using SPSS v21.0

**Results:** The results showed that the parents were aware of the number of deciduous and permanent teeth in a child's mouth (Q1-75% & Q2-72.4%), but unaware of the exfoliation of deciduous teeth (Q4-64.2%) and subsequent eruption of permanent teeth (Q6-24.5%). The management options selected for FPM were also found to be inappropriate (Q14-16). The parents were unaware of the significance of caries and negative impact of the extraction of FPM (Q20-22) on their child's dentition.

**Conclusion:** The ignorance of parents about the eruption and importance of FPM often leads to selection of inappropriate choices during treatment planning. There is need to emphasize the importance of FPM during interaction with parents and reinforce the same.

**Current Discussions in Toothpaste Formulations for Children**

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**Background:** Permanent, young permanent and primary teeth display physiological and structural differences. Additionally, the age dependent risk of toothpaste swallowing increases the importance of ingredients used in the formulations of children`s toothpastes.

**Literature review:** Toothpaste formulations are comprised of surfactants, abrasives, thickeners, humectants, sweeteners, and anti-caries agents. However, Sodium Lauryl Sulphate, an extensively used surfactant in adult formulations, is reported to be a cytotoxic agent and should not be present in children`s toothpastes. Abrasive compositions should be altered and be compatible with the low calcification level of primary and young permanent dentition. Furthermore, combined usage of thickeners is important to achieve the optimal consistency of a toothpaste. Toothpastes with optimal consistency help not only parents but also children in adjusting the recommended fluoride dose as rice or pea sized to prevent dose dependent fluoride toxicity. Children with low-caries risk can use non-fluoridated toothpastes with the same effectiveness as fluoridated pastes, however for high risk children any evidence-based alternative for fluoride is not yet reported. In the search for non-fluoridated anti-caries agents, research is still carried out on xylitol, theobromine, microcrystalline hydroxyapatite (HAP), calcium sodium phosphosilicate bioactive glass, and CPP-ACP as agents with remineralization potential.

**Conclusions:** Toothpaste formulations for children should take various factors into account for different needs of children and different stages of child development.

**Evaluation of Antimicrobial Activity of Glass Ionomer Cement Incorporated with Cashew Nut Shell Liquid**

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**Background:** Dental caries remains a significant oral health problem in children all over the world. Atraumatic restorative treatment (ART) has been used in pediatric restorative dentistry to control the caries. However, hand excavation instruments do not remove carious dentin as effectively as rotary burs, and cariogenic bacteria can remain under glass ionomer cement (GIC). Therefore, antibacterial agents have been used to improve the antibacterial properties of the GIC. The aim of the study was to evaluate (i) the inhibitory and bactericidal activity of cashew nut shell liquid (CNSL) against oral bacteria; and (ii) the antibiofilm potential of conventional glass ionomer cement incorporated with CNSL.

**Methods:** The antibacterial effect of CNSL against *S. mutans*, *S. mitis*, *S. sobrinus*, *S. sanguinis*, *S. salivarius* and *L. casei* was assessed by determining the minimum inhibitory (MIC) and minimum bactericidal (MBC) concentrations. The antibiofilm effect of the glass ionomer cement incorporated with the substance against a mixed-species biofilm of *Streptococcus mutans* and *Candida albicans* was determined by direct contact test. The values were submitted to statistical analysis by one-way ANOVA and Tukey's test ( $p < 0.05$ ).

**Results:** CNSL showed antibacterial activity for all strains tested, with MIC and MBC values ranging from 3.12 to 25  $\mu\text{g/ml}$ . Furthermore, CNSL-doped glass ionomer showed antibiofilm effect once there was no growth of colony forming unit counting (0.00 CFU/ml).

**Conclusion:** CNSL-doped glass ionomer cement has the potential to be used as antibacterial restorative material.

**Dietary Factors and Dental Caries among 15-year-old Adolescents in Northwest Russia**

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**Background:** To assess the prevalence of dietary factors influencing the caries prevalence and experience among 15-year-old adolescents in the Arkhangelsk region.

**Methods:** 1172 15-year-old from 7 urban and 5 rural settings participated in a cross-sectional study. Standard WHO methodology and questionnaire were applied. Prevalence of caries was presented with 95% confidence intervals (CI). Associations between dietary factors and caries prevalence and experience were studied using multiple logistic- and linear models, respectively.

**Results:** Parental education was positively associated with consumption of fruit ( $p=0,042$  for paternal- and  $p=0,001$  for maternal education) and inversely associated with consumption of soft drinks ( $p=0,006$ ,  $p=0,021$ ) by the adolescents. The prevalence of caries was 87.6% (95%CI: 85.6-89.4). The DMFT index was 4.61 (95%CI: 4.40-4.81) with no gender differences. Odds of caries were more than twice as high among adolescents who reported consumption of soft drinks once a week or more often (OR=2.20) and more than three times as high among those who drank soft drinks daily (OR=3.28) compared to the reference group. Adolescents who reported drinking soft drinks at least once a week had DMFT index on average 0,66 (95% CI: 0,31-1,19) greater than in the reference group.

**Conclusions:** Adolescents in Arkhangelsk region rarely consume fresh fruit while many consume sweets three times a day. Gender, place of residence and parental education are significantly associated with adolescents' diet. Consumption of soft drinks had the greatest impact on caries prevalence and experience.



**Carious Teeth: The Earlier We See them, Earlier we Save Them**

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**Background:** Carious teeth are a global burden with around 80-90% of children being affected. Therefore as paediatric dentists, it is our prime duty to intervene in the carious procedure at an early stage and hence treat them with minimal intervention which is beneficial in both behavior shaping and instilling proper oral hygiene at an earlier stage which reduces the caries burden at later stages. This review outlines that it can be done using various advanced caries detecting aids along with various existing conventional methods

**Literature Review:** Srilatha A et al. (2019) state that illumination methods like FOTI, Wavelength Dependent FOTI & DIFOTI use a narrow white light beam to transilluminate disrupted crystalline enamel and dentin. Various other modalities like MIDWEST CARIES ID™ (MID) uses fiber optic signature, Endoscopy techniques (using filtered and light fluorescence, Videoscope), IOTV (using visualization camera), ECM (electrically caries detection), radiography (digital imaging, subtraction radiography, CT, TACT, TMR, X-Ray microtomography), lasers (QLF, Diagnodent, OCT, CARIESCAN ) are also available. Recent aids like MRM, multiphoton Imaging, polarized Raman spectroscopy, modulated (frequency-domain) infra-red photothermal radiometry, Terahertz imaging, infrared fluorescence and thermography, and many more are at the horizon which together help in detecting early demineralization.

**Conclusion:** Advanced diagnostic technologies are increasingly important in detecting early dental caries, which together with comprehensive visual assessment will help in curbing this infectious disease.

**The use of Photodynamic Therapy in Pathogenic Biofilm in Primary Teeth**Karla Cabral<sup>2</sup>, Marília Correa<sup>1</sup>, Diana Feitosa<sup>1</sup>, Ginna Gonçalves<sup>1</sup><sup>1</sup>*Odontopediatria, Academia Cearense De Odontologia, Fortaleza, Ceará, Brazil*<sup>2</sup>*Odontologia, Universidade De Fortaleza, Fortaleza, Ceará, Brazil*

**Background:** The Dental plaque can be defined as a community of various microorganisms found on the surface of the tooth, as a biofilm, incorporated into an extracellular matrix of host and microbial origin polymers. The objective of this study and to show a literature review on photodynamic therapy in the treatment of biofilm dental pathogen in infant patients.

**Literature Review:** PDT can be a potential alternative to treatment, since the eradication of target cells is achieved through the action of cytotoxic species, including free radicals and reactive oxygen species produced by the interaction of a photosensitizer and light irradiation in a specific wavelength (formaximum absorption of photosensitizer). Thus, bactericidal activity is due to these reactive species produced, with resistance being improbable. We can conclude that PDT is already used in oral biolfilm, in order to reduce pathogenicity, but there are notmany studies that prove such efficacy in the primary dentition.

**Conclusion:** Considering the increasing capacity for adaptation that these micro-organisms present and their corresponding survival mechanisms, it is possible to perceive the importance of thisresearch in this area, especially of studies related to the development of antimicrobial resistance through the formation of biofilm, since the treatment measures currently employed have not been satisfactory to completely eradicate the pathogens.

**Envisioning the Future of Restorative Materials**

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**Background:** Dental caries is a highly prevalent and costly disease in the world, representing the most common infectious disease in the paediatric population. Restoration of decayed primary teeth is important so as to maintain the health of the primary teeth for proper chewing and eating, providing space for the permanent teeth and guiding them into the correct position and permitting normal development of the jaw bones and muscles.

**Literature review:** Many direct filling materials are available in modern day dental practice. Amalgam was first introduced to western dentistry in the 19th century while the glass ionomer cements were introduced around the 1970s. Composite became standard restorative material in 1980s while resin modified glass ionomers and compomers came into practice in 1990s and the current decade saw the launch of several bulk-fill composites. Multicolored restorative material like Fuji VII and MagicFill are manufactured in various bright colors with glitter inclusions to attract the children. It is polymerized both by light cure and chemical resin cure with high physical strength. Recently, bioactive dental materials are introduced which stimulates the formation of apatite and chemically bonds to teeth sealing the cavity. ACTIVA bioactive is the only esthetic bioactive restorative material.

**Conclusions:** Thus, oral health professionals need to make wise decisions about the type of restorative material to be used to best manage the patients with childhood caries.

### Oral Hygiene-Related Knowledge in Relation to the Oral Health in Adolescent Children in Latvia Longitudinal Study

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**Background:** Caries is the main oral health problem affecting school-age children. Thanks to modern prevention methods there has been a significant reduction in intensity of caries. The aim of study was to evaluate the oral hygiene-related knowledge, self-efficacy and motivation of adolescent children, with their current oral hygiene practices to assess the effect of patient motivation after regular professional dental hygiene.

**Methods:** The study included 102 thirteen-year-old children (56 girls, 46 boys). Caries intensity, assessment plaque, dental calculus and periodontal status was determined during the visit. Children underwent professional oral hygiene, were motivated to maintain good oral health and interviewed about their oral hygiene routine. Oral health status was determined every six months for five years. In the analysis of data of the study subjects, descriptive and analytical statistical measures were calculated using IBM SPSS 22.0.

**Results:** At baseline, the mean DMFT index was 4.58 (SD=3.09), but DMFS was 7.57 (SD =6.63). The DMFT increased ( $p < 0.001$ ), reaching 5.28 (SD=3.62); the DMFS also increased ( $p < 0.001$ ), reaching 9.10 (SD=7.77). Incipient lesions decreased from 2.87 (SD=2.65) at baseline, reaching 2.74 (SD=2.89) ( $p < 0.001$ ). The number of filled teeth increased, reaching 3.67 (SD=2.57) with 4.29 (SD=3.20) at baseline ( $p < 0.001$ ). The number of healthy sextants was 3.22 (SD =1.99); it decreased reaching 2.65 (SD=2.12). These changes correlate with the number of bleeding sextants increasing from 2.2 (SD=1.81) to 2.49 (SD=2.03). The number of sextants with dental calculus was 0.55 (SD=1.0) at baseline and increased ( $p < 0.001$ ) reaching 0.84 (SD=1.3).

**Conclusions:** After five years, there were no visible improvement in oral health, but the patient education have implications throughout the most influential stages of children's lives, enabling them to develop lifelong sustainable attitude and skills on the oral health.

**Less is More -Minimal Intervention for Children with Deep Carious Lesions Involving the Inner Third of Dentin**

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**Introduction:** Managing deep carious lesions, particularly the ones invading the inner third of dentin (radiographically) in young children, can be challenging especially when the lesion is approximating the pulp but with no clinical and radiographic signs and symptoms of pulp pathology.

**Case Series:** 7 molars (6 primary molars and 1 young permanent molar) in 5 children between the ages of 3Y11M and 7Y9M with deep caries approximating the pulp were managed by minimal intervention. 3 primary molars and 1 young first permanent molar were treated by selective caries removal followed by placement of biodentine as a liner, resin modified glass ionomer cement restorations and stainless steel crowns (SSC). 2 primary molars were treated by selective caries removal and SSCs. 1 primary molar was treated with silver diamine fluoride modified atraumatic restorative treatment (SMART) and SSC. The follow up period averaged 19.5 months with a range of 12 to 32 months. All the molars at follow up were clinically sound with stable restorations and radiographically showed no periapical or furcal pathology .

**Discussion:** With the advent of bioactive materials like Biodentine and the caries arresting liquid, silver diamine fluoride, put together with better understanding of the caries process and pulpal response , such lesions can be treated with minimal intervention .

**Conclusion:** Avoiding pulp exposure by using the technique of selective caries removal, bioactive materials or SDF in such teeth allow them to be retained long-term and avoid potentially painful, expensive and invasive endodontic treatments.

**Oral Hygiene in Edentulous Infants and its Influence on Mutans Streptococci and Lactobacilli**

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**Background:** Pediatric dentistry has been focusing on prevention, considering the clinical challenges during the operative procedures in the early childhood, the costs that they represent to the public health system and the impact of caries in children's quality of life. This study aimed to evaluate if the hygiene of the oral cavity of edentulous infants influences the colonization of mutans streptococci (MS) and lactobacilli (LB).

**Methods:** Twenty edentulous infants (4-10 months), attending public daycare centers at Bragança-SP/Brazil were assigned into two groups: experimental group - infants who had their oral cavity cleaned (gauze + filtered water) once a day at home by their parents, as well as in the nursery; and control group - infants who did not have their oral cavity cleaned, neither at home nor at the daycare centers. Oral samples were collected for pathogenic microorganisms enumerated on in specific media at initial assessment of the oral cavity and at 30 days after cleaning, or not, of the infants oral cavity.

**Results:** Lack of statistical significance in both studied groups (experimental and control) was found regarding MS and LB colony forming units between baseline and 30 days (p-0.05 – Wilcoxon test).

**Conclusion:** It might be suggested that the hygiene of the oral cavity before primary teeth eruption does not significantly interfere in MS and LB counts.

**The Effect of Vital Pulp Therapy Using TheraCal LC versus MTA-Angelus on Survival Rate of Cariously-Exposed Vital Young Permanent Molars: A Randomized Clinical Trial**

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**Background:** Carious pulp exposure of immature permanent first molars in children is a widespread unfortunate event. Choice of pulp capping materials could have a massive influence on the success of vital pulp therapy. Aim of the current study was to compare pulpotomy of cariously-exposed vital young permanent molars using TheraCal-LC versus MTA-Angelus regarding tooth survival rate, chairside time and radiographic success.

**Methods:** This was a double blind randomized clinical trial.. Twenty-two permanent molars were treated, 7.7 years was the mean age of participants. Steps of the procedure included nerve block administration, rubber dam isolation, pulpotomy, direct application of capping material, placement of glass ionomer base and composite resin final restoration. Only 20 teeth finished follow-up for five years. Pre-calibrated blinded dentists assessed clinical and radiographic results separately with an excellent strength of agreement (Kappa =0.85).

**Results:** Using absolute risk reduction following results were obtained: Clinically, the risk of spontaneous pain and swelling was 7-times, and 5-times, more in TheraCal group, respectively. Radiographically, the risk of periapical radiolucency and root resorption occurrence was 9-times, and 2-times more in TheraCal group, respectively. The probability of root maturation was 20% less in TheraCal group. The overall clinical and radiographic success rate for MTA was 90.9%. The overall clinical and radiographic success rate for TheraCal was 18%. Results were statistically significant.

**Conclusion:** MTA is excellent for pulpotomy in young permanent molars. TheraCal LC is not suitable for pulpotomy in young permanent molars.

**Descriptive Analysis of the Effectiveness of different Treatments of Initial Caries Injuries in Deciduous: Randomized Clinical Study- Partial Data**

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**Background:** Initial caries lesions in patients with cavitations may progress to more severe lesions. The present study compared the arrestment / progression of initial active caries lesions in primary tooth enamel, using fluoride varnish, PRG Barrier Coat and brushing protocols with fluoride dentifrice.

**Methods:** A randomized clinical study was carried out with patients between 4 and 9 years old with initial active enamel lesions on primary teeth enamel (ICDAS score 1, 2 and 3). The included teeth were allocated into three groups: Fluoride Varnish (Duraphat®, 5% NaF) (n = 6), Barrier (PRG Barrier Coat ®- Shofu) (n = 6) and Brushing with fluoride toothpaste (1100 ppm fluoride) (n = 6). Longitudinal monitoring was performed over a period of 1, 3 and 6 months.

**Results:** After the first month, 33.3% of the total number of lesions were inactivated – 100% of the lesions in the Fluoride Varnish Group, and none of the lesions in the Barrier and Brushing Groups. Throughout the study, progressive inactivation was achieved such that at 3 months, 72.2% of lesions had become inactive and by 6 months, 100% of the lesions had become inactive.

**Conclusions:** All evaluated treatments in this study were able to arrest initial active carious lesions in primary teeth within 6-months.



# ***Dental Anomalies***

**Multidisciplinary Management of Amelogenesis Imperfecta with Class III Malocclusion in a 9-year old Child**

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**Introduction:** Amelogenesis Imperfecta is a rare dental anomaly characterized by defective enamel formation. Management of this rare, inherited disorder includes preventive and esthetic restoration of affected teeth. If the condition is associated with skeletal malocclusion it can get complicated. The aim of this case report was to present the multidisciplinary management of Amelogenesis Imperfecta with Class III malocclusion in a 9-year old child.

**Case Report:** An oral examination of a 9-year old female revealed yellowish discoloration and short, deformed crowns of teeth. Multiple deciduous and permanent teeth were affected by Amelogenesis Imperfecta. The patient also had molar Class III malocclusion and anterior crossbite. Cephalometric analysis showed a skeletal Class III relationship with maxillary hypoplasia and normal mandibular position. Preventive and restorative treatment including pit and fissure sealants, fluoride treatment, composite and resin-modified glass ionomer cement restorations, and stainless steel crowns were rendered. To correct Class III skeletal malocclusion, orthopedic treatment with rapid maxillary expansion and protraction facemask therapy was instituted.

**Discussion:** The treatment was aimed to provide a stable, functional occlusion and a pleasing smile to the patient. Slight to moderate loss of tooth structure was managed with tooth-colored restorations. Stainless steel crowns were placed on permanent molars to allow normal growth to occur. Amelogenesis Imperfecta with Class III malocclusion has an overwhelming psychological impact. Protraction facemask therapy has been known to provide positive treatment outcomes.

**Conclusion:** Early intervention of these conditions improves function and facial esthetics, and prevents further damage of teeth, bone, and soft tissues.

**Tooth Crown Dimensional Changes in Preterm Children: A Systematic Review and Meta-Analysis**

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**Background:** Preterm birth is associated with many risk factors that have significant effects on overall health in general and on dental structures. The purpose of the study was to systematically analyze and quantitatively synthesize the available evidence regarding the effect of preterm birth on permanent tooth crown dimensions.

**Methods:** The present review was based on the specific protocol developed and piloted following the guidelines outlined in the PRISMA-P statement. Search without restriction for published and unpublished literature was conducted. Controlled studies investigating the effect of preterm birth on permanent tooth crown dimensions were reviewed. Following study retrieval and selection, relevant data were extracted, and the risk of bias was assessed using the Newcastle-Ottawa Quality Assessment scale. Exploratory data synthesis was performed using the random-effects model for meta-analysis.

**Results:** Three studies were finally identified from the initially located records. Overall, children born pre-term seemed to have smaller permanent tooth crowns in comparison to the control group children. The extremely preterm group showed statistically significant smaller mesiodistal dimensions in upper central incisors [95% CI -0.704 to -0.351, p-value=0.000], upper first molars [95% CI -0.631 to -0.312, p value=0.000], lower central incisors [95% CI -0.304 to -0.144, p value=0.000], lower lateral incisors [95% CI -0.447 to -0.236, p value=0.000] and lower first molars [95% CI -0.587 to -0.139, p value = 0.002], as well as statistically significant smaller buccolingual dimensions in upper first molars [ 95% CI -0.817 to -0.225, p value=0.001] and lower first molars [95% CI -0.822 to -0.299, p value=0.000]. The dimensional changes tended to be greater in the extremely preterm than other children born before term and were mostly observed in the early forming teeth like central incisors and first molars.

**Conclusion:** Through analysis of the limited set of data, preterm birth may affect tooth-crown dimensions in permanent teeth. Further research is needed to confirm these initial observations.

**Oral Rehabilitation in a Patient with Jeune Syndrome Presenting with Multiple teeth Agenesis**

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**Introduction:** Jeune syndrome (JS) is a rare disease, with systemic manifestations, such as renal and hepatic insufficiency, retinal pigmentation, and respiratory insufficiency. Etiological factors have not been completely elucidated, but the molecular biology has contributed to the diagnosis and understanding of Jeune syndrome (JS) with DNA sequencing, showing the association among polymorphisms in different genes DYNC2H1 (MIM 603297) and TCTEX1D2 (MIM617353) are the main genes associated with JS. There are a few reports on buccal findings in these patients, here, we present dental anomalies and clinical oral findings in a patient with JS, focusing on a multidisciplinary approach for rehabilitation.

**Case report:** A 15-year-old boy with JS was referred to our dental clinic. Clinical and radiographic examination revealed the presence of dental agenesis, taurodontism, and geographic tongue with lobulations. The treatment plan consisted of preventive, restorative, surgical, and oral rehabilitation.

**Discussion:** We reported a clinical case of JS with oral findings not reported previously. We described teeth agenesis and taurodontism as possible oral phenotypic characteristics of JS. Furthermore, we presented a dental approach for a person who, although young, exceeded the life expectancy of most cases reported in the literature.

**Conclusion:** Rehabilitating function and esthetics promotes a better quality of life owing to improved masticatory function, esthetics, maintenance of oral health, and above all, helps the patient with inter-human relations and improves their self-esteem.

**Differential Diagnosis Framework between MIH and Hypoplasia: A Report of Three Cases**

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**Introduction:** Molar and incisor hypomineralization (MIH), is a specific clinical entity that presents demarcated opacities in 1st permanent molars, also affecting permanent incisors. Recently, 2nd primary molars have been reported with comparable lesions, referred as second primary molar hypomineralization (HSMP). The etiology of MIH and HSMP has been associated with disorders during birth, such as neonatal asphyxia, respiratory problems, and systemic diseases in the first 3 years of life.

**Case report:** Female patient, 5 years, with severe early childhood caries, history of severe neonatal asphyxia, with oxygen support, food allergy and risk of malnutrition in the first 3 years of life. In clinical examination, she presented caries lesions in 1st primary molars that were treated and hypomineralizations in 2nd primary molars. In dental control at 7 years, eruption of 1st permanent molars with severe enamel development defects was observed in 1.6, 2.6 and 3.6, and mild hypomineralization in 4.6 and upper incisors (1.1-2.1).

**Discussion:** The HSMP has been shown to be a potential indicator of MIH in various studies, therefore, it is important that the pediatric dentist performs an anamnesis of pre/postnatal history, a correct clinical examination and detect opacities in primary molars early, to perform a correct treatment approach and decrease the possible consequences of MIH.

**Conclusion:** Faced with the clinical finding of HSMP, parents should be informed of the potential implications, reinforce oral care at home and control periodically the moment of eruption of 1st permanent molars, allowing an opportune diagnosis and treatment.

**HSMP: Potential indicator of MIH? Case report**

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**UnTie - The Tied Tongue**

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**Introduction:** Ankyloglossia or tongue tie in children poses a diagnostic challenge for dentists. The tongue is an important oral structure that affects speech, position of teeth, periodontal tissue and swallowing. It is a congenital anomaly characterized by an abnormally short, thick, lingual frenulum which may be fibrous or muscular, and may be complete or partial and cause restriction in function of tongue. The purpose of this report is to present the surgical management of a 6 year-old child having ankyloglossia associated with difficulty in speech.

**Case report:** A 6 year-old child reported with chief complaint of difficulty in speech and impaired tongue mobility. There was no contributory medical or family history. On intraoral examination, he was unable to touch roof of his mouth with the tip of the tongue when the mouth was open and was diagnosed with Class IV ankyloglossia according to Kotlow's classification. The parents of child were informed about the treatment procedure, and informed consent was obtained. The treatment involved was surgical removal of the lingual frenum under local anesthesia using a standard surgical technique followed by tongue training exercise and speech therapy to functionally rehabilitate the tongue.

**Discussion:** The correction of ankyloglossia at an early age prevents possible dental problems associated anomalies and reduces the risk of latent complications. Frenectomy is defined as complete excision of whole frenulum.

**Conclusion:** Treatment of ankyloglossia in younger children helps alleviate the speech and dental developmental problems by improving the functions of the tongue.

**Molar Incisor Hypomineralization (MIH) and its Prevalence the Impact of Oral Health Related Quality of Life in Schoolchildren in the City of Macapá, Amapá, Brazil**

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**Background:** To date, few studies have evaluated the impact of molar incisor hypomineralization (MIH) on the oral health related quality of life (OHRQoL) in schoolchildren. The main target of this study was to first assess the MIH prevalence in Brazilian schoolchildren and second, to investigate the impact of MIH on the OHRQoL.

**Methods:** A cross-sectional study was carried out in 1.155 children aged 8 to 10 years old, coming from public schools in Macapá, Brazil. Calibrated dental examiners performed the children's oral examination for MIH using EAPD criteria. The children answered the Child Perceptions Questionnaire (CPQ8-10). Poisson regression was used to determine associations between the variables.

**Results:** The prevalence of MIH in first permanent molars was 30.8%. Most children (93.7%) have presented some impact, with 89.6%, 68.4%, 66.8% and 62.8% have shown impact on the domains of oral symptoms, functional limitation, emotional well-being and social well-being, respectively. Younger schoolchildren have presented a greater impact on the functional limitations domain (PR: 1.15; 95% CI: 1.04-1.27). However, children with MIH presented a greater impact in the oral symptoms domains (PR: 1.06; 95% CI: 1.02-1.10), functional limitations (PR: 1.26; 95% CI: 1.17-1.35), Emotional well-being (PR: 1.24; 95% CI: 1.15-1.34), Social well-being (PR: 1.26; 95% CI: 1.16-1.38), as well as in the general quality of life (PR: 1.05; 95% CI: 1.02-1.08).

**Conclusion:** It was concluded that the MIH prevalence in Brazilian schoolchildren was high. MIH showed a significant impact on OHRQoL according to children's perceptions.



**Compromised First Permanent Molars: Generating Utility Values for Different Treatment Strategies**

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**Background:** Economic evaluation assesses the costs and benefits of different treatment options. Valuing treatments requires an understanding of patient preferences. A utility is a cardinal measure of preference attached to a health state. Data on utility values are sparse in dentistry. The aim of this study was to assess the feasibility of generating utilities for compromised first permanent molars (cFPMs) from a sample of the general public, and to generate utility data to support an economic evaluation of treatment options for cFPMs.

**Methods:** This is an observational study conducted within a Paediatric Dentistry department. Participants included fifty parents of patients who attended the outpatient assessment clinic. A novel questionnaire was developed to elicit utility values for different dental health states. The question formats included a ranking, visual analogue scale (VAS) and time trade off (TTO) exercise.

**Results:** Mean utility values for each health state were generated using the VAS and TTO data. A white filling generated the highest utility (0.786 [VAS], 0.763 [TTO]) and was ranked as the most favourable treatment option. Dental extraction and persistence of a gap generated the lowest utility (0.344 [VAS], 0.523 [TTO]). The ranking and VAS responses had better agreement than the ranking and TTO responses.

**Conclusions:** Generating utility values for cFPMs is feasible. The VAS method appeared to generate the most robust values. This is likely related to the level of participant understanding. These utility values can be used in future cost utility analyses to test the cost effectiveness of management strategies for cFPMs.

**Four Case Reports of a Rare Dental Anomaly: Solitary Median Maxillary Central Incisor**Bilal Ozmen<sup>1</sup>, Hatice Zehra Bodur Guney<sup>2</sup>, Sukru Ozcelik<sup>3</sup><sup>1</sup>*Department of Pediatric Dentistry, Ondokuz Mayıs University, Faculty of Dentistry, Samsun, Turkey*<sup>2</sup>*Department of Pediatric Dentistry, Giresun University, Faculty of Dentistry, Giresun, Turkey*<sup>3</sup>*Pediatric Dentistry, Freelance Dentist, Samsun, Turkey*

**Introduction:** Solitary median maxillary central incisor (SMMCI) syndrome is a rare disease affecting 1 in 50000 newborns. It can be observed in both primary and permanent dentition. Due to the eruption of maxillary central incisor in the midline, upper lip's middle part elevates and leads to indistinct philtrum. Labial frenulum may not be present and a prominent ridge in the midline of palate from central incisor to soft palate can be observed. SMMCI may be observed with various midline defects, growth deficiency or other systemic anomalies. The etiology is not known exactly. In these case reports, it was aimed to present the solitary median maxillary central incisor anomaly characterized by the deficiency of the upper jaw single central tooth.

**Case report:** In the routine dental examination, a single central tooth in the upper jaw was observed in the 6, 8 and 9 years old female patient and 8 years old male patient who presented to our clinic. It was learned that there was no history of tooth loss due to trauma or extraction in the anterior region. In the detailed intraoral and radiographic examination, it was clarified that the patients had an SMMCI tooth.

**Discussion:** SCMMI characterized by maxillary midline single central incisor, may be ignored and may not cause aesthetic anxiety, but this situation may be the precursor of congenital malformations and the patient should be evaluated systemically.

**Conclusion:** Early diagnosis of SMMCI is important for clinicians, as it may be a sign of other serious congenital or developmental abnormalities.

### A Retrospective Study of Mesiodens using Cone-beam Computed Tomography in the Department of Pediatric Dentistry, SNUDH

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**Background:** Mesiodens is defined as a supernumerary tooth in the premaxillary region. The purpose of this study was to investigate the three-dimensional characteristics of mesiodens using Cone-beam Computed Tomography(CBCT) and analyze the correlation with complications and anesthetic methods of extraction.

**Methods:** This study evaluated 602 mesiodens of 452 patients who underwent extraction of mesiodens at the department of Pediatric Dentistry in Seoul National University Dental Hospital between 2017 and 2019.

**Results:** The number of mesiodens patients per year has been gradually increasing over the past 20 years. Sex ratio was 2.45 : 1, higher in boys(53.3%). 67.3% of patients had 1 mesiodens. The majority of mesiodens were conical(69.3%) and inversely(61.1%) impacted(92%). Mesiodens with labio-palatally horizontal direction were observed about 3.2 times more often than the mesio-distally horizontal direction. Mesiodens were most commonly located at the cervical side of the adjacent teeth(37.0%) and mesiodens located in the palatal side were observed about 3.83 times higher than the far-palatal side. Most of the mesiodens(82.1%) were in contact with adjacent permanent teeth as shown on all three-dimensional sides of the CBCT and 53.8% of mesiodens had straight roots. The patient's age, vertical position, and proximity had correlations with anesthetic method of extraction. The direction and vertical position of mesiodens had correlations with complications.

**Conclusion:** These results provide a better understanding of mesiodens for establishing an accurate diagnosis and treatment plan.

**Enamel Hypoplasia of Permanent Successors due to Dental Trauma in Primary Teeth : Three Case Reports**Bilal Özmen, Şeyma İrem Küçük*Faculty of Dentistry, Department of Pediatric Dentistry, Ondokuz Mayıs University, Samsun, Turkey*

**Introduction:** Developmental defects in permanent teeth usually occur as a result of trauma in the primary teeth. Pulp necrosis, tooth discoloration, enamel hypoplasia, ectopic eruption, crown dilacerations can occur on permanent teeth. The purpose of this report is to present the effects and treatments of trauma to primary teeth on their permanent successors.

**Case 1:** An eight years old boy patient's left maxillary central incisor tooth had hypoplasia. Radiolucency was observed on the affected tooth's crown by radiography. Patient's parents reported a history of trauma at the age of two years. As treatment an aesthetic restoration with resin composite was performed.

**Case 2:** An eight years old girl patient's right maxillary central, lateral incisor teeth had hypoplasia. Her parents told a history of trauma at the age of eighteen months. Aesthetic restorations were planned but patient's parents didn't want the treatment.

**Case 3:** A twelve years old girl patient's parents told a history of trauma at the age of two years old. Due to that, her permanent left mandibular three anterior teeth became hypoplastic. Radiographic observation showed radiolucency on the affected teeth's crown. Aesthetic restorations were performed.

**Discussion:** Traumatic primary teeth can cause hypoplasia on the permanent teeth. Direct composite veneer can be used as treatment in enamel hypoplasia. This is easy to apply and repairable. Teeth with a developmental anomaly can also be treated using crowns.

**Conclusion:** Functional and aesthetic needs of patients can be provided by treating hypoplasias in permanent teeth due to trauma to primary teeth.

### Conservative Treatment of Affected Dental Organ with Molar Incisor Hypomineralization

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**Introduction:** Molar Incisor Hypomineralization (MIH) is systemic enamel defect that occurs in the first permanent molars in association with incisors. The affected enamel often leads to rapid loss of structure after eruption due to exposure to chewing forces and which is affected by dental caries. The hybrid glass ionomer has been shown to be effective in remineralizing enamel and dentin due to its fluoride release. The propose of this report is to present the conservative treatment in MIH.

**Case report:** A 12-year-old male patient, showed at intraoral inspection, tooth #21 with demarcated opacity of white color, in 16 loss of complete dental structure in occlusal; in 26 and 36 yellowish/brown enamel, tooth sensitivity, pulp vitality, and mismatched restorations were observed. On x-rays it was observed, in molar 46, endodontic treatment. The diagnosis was moderate MIH. It was performed, in molar 26, indirect pulp coating and restoration with hybrid glass ionomer with resin coating for demineralization of the hypomineralized enamel. The evolution at six months of follow-up of 26 indicated satisfactory marginal adjustment and preservation of pulp vitality.

**Discussion:** The restoration of molars with moderate MIH with glass ionomer according to Souza et al., as well as Fragelli et al., reason why in the present case it was decided by a hybrid glass ionomer with high fluoride release for the remineralization, aesthetic and with increases wear resistance.

**Conclusion:** Maintaining the integrity of dental structure in molars affected by MIH restored with hybrid glass ionomer maintaining the affected area, promoting remineralization.

### **A Three-Year Evaluation of Maxillary Canines in Terms of Ectopic Eruption: A Case Series**

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**Introduction:** Maxillary canines are the most frequently impacted permanent teeth after the third molars. Impacted canines are associated with ankylosis, formation of cysts, internal and external root resorption and loss of space. On radiographic examination, canine ectopic eruption can be predicted by the early evaluation of the angle between the longitudinal axis of the canine and the midline [0-15 (Grade 1), 16-30 (Grade 2), 30(Grade3)]. The purpose of this case series is to assess the changes that occurred over three years in maxillary canines with an initial radiographic evaluation of Grade 3.

**Case report:** In this case series; 10 patients with one or more Grade 3 maxillary canines whose initial radiographs were taken around the age of 10 and had at least one follow-up radiograph, were randomly selected from 1200 patients whose panoramic radiographs had been evaluated. No intervention was made in terms of canine ectopia. In a total of 15 Grade 3 maxillary canines, it was observed that 40% of the teeth have normally erupted, 33.3% showed a decrease in angular values and 26.7% remained ectopic.

**Discussion:** In the evaluated cases, the frequency of Grade 3 maxillary canines to remain ectopic over time was found to be lower compared to those reported in the literature. This may be due to differences in the number of the evaluated cases.

**Conclusion:** Although 40% of the evaluated Grade 3 maxillary canines have erupted spontaneously, follow up is recommended to allow for early intervention to the possible complications.

**Ectopic Eruption of First Permanent Molar Teeth: Case Report**

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**Introduction:** Ectopic molar eruption results from the abnormal eruptive pathway of the first permanent molar (FPM) causing its locking under the distal undercut of the second primary molar (SPM) and failure to reach normal occlusal levels. The earliest radiographic sign of ectopic eruption is the superior and mesial positioning of FPMs. According to the level of root resorption of SPMs, ectopic eruption is divided into 4 grades. The etiology of ectopic eruption is associated with dental anomalies such as tooth deficiency, supernumerary teeth and infra-occlusion of primary molars. The purpose of this report is to present 6 cases with ectopic eruption of FPMs that had no intervention.

**Case report:** In this report, the radiographs of 650 patients between the ages of 5-8 were examined. According to the degree of resorption, 72 patients were Grade 1, 14 patients were Grade 2 and 6 patients were Grade 3. 6 patients with ectopic molar eruption were selected for the presentation.

**Discussion:** Patients with ectopic molar eruption and inadequate intervention are in increased risk of space loss in the future. In Grade 1 and 2, the FPMs were successful to erupt without the removal of the SPMs, while in grade 3, resorption of the roots was aggravated. According to our results, observation and follow-up are sufficient in Grade 1 and 2, while invasive intervention is required in grade 3.

**Conclusion:** In teeth with a radiographic sign of ectopic eruption, early intervention is recommended to minimize the complications of space loss.

**Detection of Dental and Oral Anomalies with Machine Learning: Comparison between Convolutional Neural Network and Random Forest**

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**Background:** Dental anomalies are formative defects during the process of dental development and their etiologies may be diverse interactions between genetic and environmental factors. Although panoramic radiographs are an indispensable diagnostic tool against dental anomalies, dentists are required the higher level of dental training in order to identify them. This study verified that machine learning can be used to detect dental and maxillofacial abnormalities in children by comparing convolutional neural network (CNN) and Random forest.

**Methods:** The panoramic radiograph images of patients aged 6 years 5 months to 9 years were analyzed retrospectively. The total of 70 panoramic radiograph images were revalidated and diagnosed by a calibrated board-certified pediatric dentist as anomalies of oral and maxillofacial region (case group, n = 26) or no anomalies (control group, n = 44). The case group has 18 anomalies including congenitally missing teeth, odontoma, ectopic eruption, ectodermal dysplasia and alveolar bone resorption. The all images were split into a training dataset (42 images considering of 17 cases and 25 controls) and validation dataset (28 images considering of 10 cases and 18 controls). The machine learning algorithms, CNN and Random forest, were trained with same dataset, respectively. This study was approved by Ethical Committee for Epidemiology of Hiroshima University.

**Results:** The CNN was superior performance compared to Random forest in the detection accuracy, precision, recall, F1 score, and area under the curve.

**Conclusion:** These results suggested that machine learning is potentially applicable to computer-aided diagnosis of anomalies in dental and maxillofacial region.



**Excision of Ulcerated Gingival Growth using Laser and Orthodontic Extrusion of the Dilacerated Permanent Central Incisor: Case Report**

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**Introduction:** Among the many developmental anomalies, dilacerated tooth is particularly disturbance in eruption and one of the causes of delay eruption in developing dentition. And is one of the most concern esthetic problem in upper anterior region. Management of dilacerated maxillary central incisor needs multidisciplinary approach.

**Case report:** The present case report describes the application of the diode laser in ulcerated gingival growth and orthodontic extrusion of the buccally erupted dilacerated permanent central incisor. The dilacerated tooth well aligned 4 months after excision and extrusion orthodontically.

**Discussion:** Teeth with dilacerated crowns erupted buccally displaced and associated with ulcerated growth. In this case report, dilaceration is at the crown and root junction and the prominence of root tip can be palpable but not exposed. The laser in addition to basic principles are required in paediatric dental practice which provides less traumatic experience in stress free environment.

**Conclusion:** Diode laser provides an effective, rapid, simple, bloodless and well accepted procedure in paediatric patients. In addition, minimal post operated discomfort and scarring was reported. The dilacerated tooth properly aligned in the arch without the further endodontic treatment and apicectomy procedure.

### How Do School Children View Other Children Who Have Visible Enamel Defects in Sharjah, United Arab Emirates?

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**Background:** Physical appearance refers to the way someone looks, not only can it affect how individuals feel about themselves, but it may also be influenced by how other people visually judge them. The aim of this study was to evaluate how school children in the Emirate of Sharjah view their peers who have visible enamel defects?

**Methods:** A cross-sectional study design using randomized clusters sampling of public schools in the Emirate of Sharjah was conducted. Children in grade 6, aged 11-12, and grade 8 aged, 13-14, from randomly chosen schools were invited to participate in the study. The primary investigator distributed the questionnaire packs randomly, and each pack contained photographs of either subjects with enamel defects or subject without enamel defects. Statistical tests (t-test and linear regression analysis) were used to determine whether there were any statistically significant differences in the mean total attribute score (TAS) as the dependant variable and the independent variables: gender and year group (age).

**Results:** Using a four-point Likert scale, children completed the attribute questionnaire to rate the photographs according to descriptive questions. TAS was found to be significantly lower among enamel defects' photographs compared with photographs without enamel defects (p-value 0.004). For the age (grade) the value of TAS significantly increased by the increase of the age (grade) (p-value 0.035). Gender, however, did not have any significant effect on mean TAS.

**Conclusion:** Visible enamel defects influenced the social judgments of children on their peers.

### Compound Odontoma- Tooth Like Malformations

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**Introduction:** Odontomas are developmental anomalies resulting from the growth of completely differentiated epithelial and mesenchymal cells which give rise to ameloblasts and odontoblasts. An odontoma arises from deposition of enamel and dentin, leading to formation of structures with an anatomic similarity to normal teeth. 3D-imaging CBCT may be useful for an accurate positioning.

**Case Report:** A 12-year-old boy reported to clinic with a chief complaint of retained primary upper front teeth. Clinical examination revealed presence of painless bony hard bulge bilaterally in maxillary incisor region and retained primary incisors. Following clinical examination multiple radiographs were taken to identify the exact position. A 3D-CBCT also was used, which revealed presence of two radiopaque tooth-like structures seeming hindering the eruption of the permanent maxillary central incisors as well as supplemental tooth mesial to left lateral incisor. Both, supplemental tooth and suggestive odontomas were surgically removed under local anaesthesia. Histopathological examination suggested a final diagnosis of compound odontoma. A 4-year follow up was done and orthodontic treatment is planned.

**Discussion:** Odontoma represents the most common type of odontogenic benign jaws tumors among patients younger than 20 years of age. Odontomas are usually slow-growing, asymptomatic neoplasms seen in jaws. In most of cases, it is associated with impacted or unerupted teeth. Orthodontic treatment is indicated to correct malocclusion following surgical extraction.

**Conclusion:** Diagnosis of odontomas are done in combination of radiographic and histological examination. The present case report showed successful outcome of surgical removal of an odontoma at the 4 year follow up.

### **Surgical Management of Multiple Dental Anomalies in an Adolescent: A Case Report**

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**Introduction:** In complex Paediatric Dentistry cases, a multidisciplinary approach utilising other dental teams including Oral Surgery and Orthodontics, is vital. In cases of impacted and transposed teeth, treatment options range from simple to complex, with a vast variation in treatment times depending on the modality. We discuss the management of a 13-year-old referred regarding retained URA and URC, who presented with multiple dental anomalies

**Case report:** Referral to secondary care was extremely delayed, and the patient was very self-conscious of the appearance. Examination revealed UR1 and UR3 to be impacted, and UR3 was transposed with UR2. Following discussion of the options, a surgical approach under general anaesthetic was carried out, including extraction of URA and URC, autotransplantation of UR1 and UR3, and repositioning of UR2 with corticotomy.

**Discussion:** This approach reduced overall treatment time, with all treatment completed in one surgical procedure. There was an immediate aesthetic improvement, along with correction of the malocclusion. Disadvantages included the surgical operator skills required, risk of interfering with root development, and risk of loss of vitality to the involved teeth with long term follow-up required.

**Conclusion:** Plans involving extraction of primary teeth and waiting for permanent teeth to erupt, or use of orthodontic forces to move the teeth, can be less invasive but involve extended treatment times. Surgical repositioning and autotransplantation, although more invasive, have many clinical advantages. Working with the Oral Surgery team allowed simplification of a complex case, with a much improved aesthetic result that was invaluable to the patient.

### **A New Supernumerary Tooth Occurring in Same Region during Follow-up after Supernumerary Tooth Extraction: A Case Report**

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**Introduction:** A supernumerary tooth (ST) is considered as a tooth anomaly. It often occurs in childhood, and surgical treatment is performed. Because some cases require orthodontic treatment after extraction, follow-up is important. Herein, we report a rare case of a new ST occurring metachronously in the same region after ST extraction. The patient's guardian provided informed consent for publication of this report.

**Case Report:** A Japanese boy with intellectual disability was referred to our hospital with dental caries. The periapical radiograph at 5Y5M revealed that the 1st ST had occurred near tooth #61 and was extracted at 5Y11M. The periapical radiograph at 7Y5M revealed that the 2nd ST had occurred near tooth #21. We removed the 2nd ST at 7Y7M 1.6 years after the 1st extraction. There was no recurrence of ST in the postoperative period.

**Discussion:** In this case, periapical radiograph at 5Y8M revealed a very small radiolucent area near tooth #21. However, we could not perform detailed examination, such as CBCT, because the patient was not cooperative. Therefore, we continued to follow-up carefully, and periodic radiographs allowed us to detect the 2nd ST, which was removed early. Odontoma is a differential diagnosis of ST, but the new calcified tissue after removal was single and formed the configuration of the crown. Therefore, odontoma was excluded from the diagnosis.

**Conclusion:** Both intra-oral and radiographic examinations should be performed during the follow-up after extraction until the permanent teeth erupt completely.

**A Case Report: Molar-Incisor-Hypomineralisation (MIH) complicated by Non-Carious Tooth-Surface Loss (TSL) in an 8-Year-Old Boy**

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**Introduction:** MIH is a developmental, qualitative defect characterized by hypomineralised lesions affecting first permanent molars (FPMs) and frequently incisors. These teeth are prone to post-eruptive breakdown (PEB), hypersensitivity and caries. Non-cariou tooth loss may be caused by many factors including acidic drinks. Affected primary molars can be treated using preformed metal crowns (PMCs), following the ‘Hall Technique’.

**Case Report:** The patient presented with sensitivity associated with his FPMs and no aesthetic concerns. Relevant anamnesis evidenced recurrent respiratory tract infections and a history of drinking acidic drinks. Clinical and radiographic examination revealed a caries-free early-mixed dentition with mild hypodontia (absent LR2). FPMs were remarkable for hypomineralisation with PEB and UR1/UL1 presented with white labial demarcated opacities. Lower primary molars presented with significant TSL. The hypersensitivity was managed with intensive prevention including diet and oral hygiene recommendations, desensitizing toothpaste, and fluoride varnish. Primary molars were managed by placing PMCs using the ‘Hall Technique’. The FPMs were deemed to have a hopeless long-term prognosis; pragmatically extractions under general anaesthesia were agreed.

**Discussion:** The ‘Hall Technique’ requires limited patient cooperation and protects primary molars until exfoliation. The FPM extractions aimed to prevent long-term symptoms and allow optimal space closure by the second permanent molars. In the long-term, the developing dentition will be monitored with inter-disciplinary assessment as required.

**Conclusion:** Early diagnosis of MIH is imperative to facilitate the optimal timing of FPM extractions. Placement of PMCs using the ‘Hall Technique’ is an effective and patient-friendly treatment that should be in the armamentarium of every paediatric dentist.

## Dental Anomalies

**Prevalence and Perception of Dental Fluorosis among 11-13-Year-old School Children in Maiduguri, Borno State: A Pilot Study**

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**Background:** Dental fluorosis, also called mottled enamel, is a structural dental anomaly occurring due to high fluoride ingestion. It is a public health concern mostly affecting aesthetics, giving rise to low self-esteem in severe cases. This condition appears to be endemic in this region due to its geographic location, climatic condition and predisposing tendencies to high water consumption.

**Methods:** A cross sectional study of randomly selected ninety-two subjects of age range 11-13 years was carried out. Data was obtained using interviewer administered questionnaires and oral examination using World Health Organization (WHO) pro-format assessment form (WHO, 2013). Classification was done using Dean's index of fluorosis. Frequency distribution of dental fluorosis, sources of drinking water and dental perceptions were assessed. The relationship between dental fluorosis and dental perception was analysed using Chi-square test with IBM SPSS Statistics for Windows, version 16.0.

**Results:** Out of the ninety-two subjects studied, 27.2% had very mild fluorosis, 26.1% had no fluorosis, 20.7% had questionable fluorosis, 15.2% had moderate fluorosis, 6.5% had mild fluorosis and 4.3% had severe fluorosis; mostly affecting their anterior teeth. Negative perceptions occurred in 75% of those with severe fluorosis, 71.4% with moderate fluorosis and 50% with mild fluorosis (p 0.001).

**Conclusions:** In this study, a considerable proportion of subjects had fluorosis and significant proportions had negative perceptions due to prevalence and severity on their anterior teeth. There is need for further studies on sources of fluoride ingestion and fluoride mapping, in order to plan for preventive strategies and resources for treatment.

### Minimally Invasive Esthetic Treatment for Children with Molar Incisor Hypomineralization

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**Introduction:** Molar incisor hypomineralization (MIH) is a qualitative enamel defect that results in normal volume, but insufficient mineralization that contributes to opacities on one or more permanent molars and permanent incisors. Affected permanent incisors may have esthetic impact. Several techniques are used to improve tooth appearance including enamel microabrasion. However, it may be insufficient in cases we have moderate or severe stains. There is the option of covering the microabraded surfaces with resin infiltration technique in those cases. The technique is based on changes in light scattering within the lesions. The propose of this report is to present the results obtained when associating the two techniques.

**Case Report:** A case report of two girls, aged 8 and 11 years old, who sought care because they were suffering bullying due to MIH stains. Both of them underwent the same treatment protocol, including two microabrasion sessions followed by one resin infiltration session. Both techniques were performed following the manufacturer's instructions.

**Discussion:** The association of techniques showed good results, in spite of the fact that the stains did not completely disappeared.

**Conclusion:** We were able to perform a minimally invasive treatment that resulted in the patients' improvement in quality of life. .



**Developmental Dental Anomalies in Children: Prevalence and Association with Health Status**

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**Background:** Developmental dental anomalies (DDA) occur during various stages of tooth development and can be associated with inheritance, environmental exposures and/or systemic disturbances. The aim of this study was to describe the prevalence of radiographically identifiable DDA in a university-based pediatric dental clinic and to assess for associations between DDA presence and health status.

**Methods:** Retrospective data, obtained from panoramic radiographs (PR) and dental records of a three-year pediatric patient cohort were evaluated by two calibrated examiners. A chi-square test and bivariate logistic regression were used for statistical analysis.

**Results:** A total of 1,478 subjects were enrolled, including 54% male, 58% White, 49% Hispanic, three to 17 years old (median: nine years), and 69% healthy. DDA were identified in 25% of the subjects with hyperdontia, hypodontia and microdontia being the most common. A statistically significant association was found between presence of DDA and health status ( $P=0.001$ ) and between DDA and asthma ( $P=0.035$ ). Patients with systemic disturbances showed 2.12 times greater odds of having DDA ( $P=0.001$ ,  $CI=1.7-2.7$ ).

**Conclusions:** The prevalence of DDA in our university-based pediatric cohort was high with one in four patients affected. DDA in number were the most common. Patients with systemic disturbances had greater odds of having DDA.

### Investigation of The First Permanent Molar Hypoplasia in 6-9 Years Old Children

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**Background:** Hypoplasias, known to be enamel matrix anomalies, have been reported to increase susceptibility to caries. The aim of this study is to evaluate the presence of hypoplasia and caries formation in first permanent molar teeth (FPM), as well as possible factors that may play a role in the etiology of hypoplasia.

**Methods:** 90 children between the ages of 6-9 with all FPMs in the mouth, who applied to Ataturk University Faculty of Dentistry, were examined and their FPMs were scored according to ICDAS. In addition, a questionnaire about etiological factors was filled by parents. The data were analyzed by Chi-square and Mann-Whitney U tests.

**Results:** 12 (13.3%) of 90 patients had hypoplasia in their FPM and the average number of teeth with hypoplasia was  $2.83 \pm 1.53$ . No statistically significant difference was found between children with and without hypoplasia in terms of gender, region, maternal drug use during pregnancy, birth weight, preterm birth, and frequent drug consumption. The average ICDAS scores of 4 FPMs in children with hypoplasia ( $3.35 \pm 1.56$ ) were higher than those without hypoplasia ( $2.08 \pm 1.33$ ) ( $p = 0.008$ ). The number of teeth with an ICDAS score  $\geq 3$  in children with hypoplasia ( $3.08 \pm 1.24$ ) was higher than those without hypoplasia ( $1.87 \pm 1.46$ ) ( $p = 0.013$ ).

**Conclusion:** Because of the risk and severity of caries increase in patients with FPM hypoplasia, there is an increased importance of the first visit to the dentist at an early age and preventive dentistry practices for these patients.

**Compound Odontoma of the Anterior Maxilla Associated with Displaced Lateral Incisor: A Case Report**

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**Introduction:** Odontomas are the most common odontogenic tumors worldwide considered to be developmental anomalies (hamartomas) rather than true neoplasms. They can be differentiated into compound type or complex type with only the compound type resembling tooth structure. Compound odontomas are more commonly found in the anterior maxilla while complex odontomas are more commonly found in the posterior mandible. Odontomas are usually chance findings seen on routine dental examinations. However, on progression they may be associated with bone expansion, late eruption of permanent teeth, and adjacent tooth displacement.

**Case report:** We report a case of an 11-year-old girl who presented at the Lagos University Teaching Hospital (LUTH) pediatric dental clinic with a complaint of painless enlargement of the left anterior maxilla of 2-years duration. The swelling was located between teeth 21 and 22 and was associated with distal displacement and mesial angulation of tooth 22. Clinical, radiographic and histopathologic investigations revealed a compound odontoma. Surgical exposure and enucleation was done to remove the tumor. The patient's postoperative course and 6 months follow-up were uneventful. The patient was then planned for management of the malocclusion.

**Discussion:** Odontomas are clinically significant because they cause impaction and malalignment of both primary and permanent teeth making their prompt and asymptomatic removal of paramount importance for proper teeth eruption and alignment.

**Conclusion:** This report elucidates the importance of routine dental check-ups and minimally traumatic management of odontomas in pediatric dental patients to prevent adverse effects of odontomas thereby, minimizing the interventions needed after enucleation.

### Oral Health among 7- to 9-year-old Preterm Children

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**Background:** Preterm birth affects the development of almost every organ system and increases the likelihood for disability and chronic disease in childhood. Also alterations in the deciduous and permanent dentition were observed in preterm children (PTC).

**Methods:** The case-control study included 38 PTC born in Jena University hospital. 38 full-term children (FTC) of the same age and gender served as control group. All children underwent oral examination. DDE were scored with modified DDE-Index and dental caries was classified by ICDAS II. Plaque index (PI) and Periodontal Screening Index (PSI) were used for assessment of plaque and periodontal health.

Statistical data analysis was based on mean, standard deviation and 95-% confidence interval. Differences between the groups were tested with Wilcoxon ranksum-test and McNemar's test. Significance level was set  $p \leq 0.05$ .

**Results:** DDE prevalence in deciduous teeth was higher in PTC (55.3%) than in FTC (28.9%;  $p=0,008$ ). DDE severity increased with decreasing birthweight (deciduous tooth surfaces with DDE in extremely PTC: 324 vs. FTC: 281;  $p0.001$ ). Prevalence of dental caries differed insignificantly in both dentitions of PTC (47.4%) and FTC (57.9%). DMFT did not differ in both groups, but dmft was lower in PTC (1.6) than in FTC (2.7;  $p=0,035$ ). ft-component was higher in FTC (1.8 ft) than in PTC (0.7 ft;  $p=0.009$ ). Higher PI scores were scored in PTC (0.9) than in FTC (0.6;  $p=0.027$ ), but PSI showed no difference.

**Conclusions:** PTC had higher risk for DDE in deciduous teeth and poorer oral hygiene than FTC. Although dental caries and periodontal health was similar in both groups, PTC should be considered as risk group.

**A Case of Amelogenesis Imperfecta in which the Causative Gene was Recently Identified**

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**Introduction:** Amelogenesis imperfecta (AI) is classified into three types according to the nature of the enamel. Most cases of dysplastic teeth are due to an inherited disease for which many causative genes have been reported. A patient may have pain immediately after tooth eruption, which may lead to pulpitis and, in some cases, to a poor prognosis. Recently, deletion of a gene that appeared to be the causative gene has been identified, and thus, we report it along with the long-term management of AI.

**Case report:** AI was diagnosed from the oral symptoms by a referral dental clinic. The patient was to be managed at our clinic from 4 years 7 months of age due to poor prognosis. At 5 years 11 months, the yellowish first molar teeth began to erupt with cold pain. It was covered with cement; however, pulpitis and, depending on the tooth, apical periodontitis developed later. A mutation was identified in latent transforming growth factor-beta-binding protein 3 (*LTBP3*), which encodes extracellular matrix.

**Discussion:** It was revealed that dentin had some hypoplasia and enamel was scarcely formed from the specimen prepared with extracted wisdom teeth. Wide-ranging gene analysis revealed a mutation that are considered to be causative genes.

**Conclusion:** A mutation in *LTBP3* was identified in a patient who underwent long-term oral care from 4 years of age. It is said to be related to dental anomalies and short stature, and is consistent with her phenotype.

**Children with Molar-Incisor Hypomineralization can Present Pain and Anxiety?**

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**Background:** Molar-Incisor Hypomineralization (MIH) is a qualitative defect of dental enamel that affects at least one first permanent molar and is often found in permanent incisors. As fundamental characteristics, MIH presents demarcated opacities, of variable color, from white to yellowish/brownish. In some cases, post-eruptive enamel breakdown can occur. Increased risk of dental caries, long-term hypersensitivity, anxiety and impact on quality of life can occur in these patients. The aim of this study was to evaluate the association between dental pain and anxiety in children who presented MIH.

**Methods:** 168 children participated in the study, with dental pain assessment using the Visual Analogue Scale and Faces Scale; anxiety and fear has been assessed using the questionnaire "Research schedule on child fear - dental subscale" translated and validated in Portuguese. A chi-square and ANOVA test was performed, followed by the Tukey post-test, with a significance level of 5%.

**Results:** There were no reports of pain by 101 children (60.1%), while 67 children (39.9%) reported pain. In addition, the average level of anxiety for children who were not reported pain was 27.6 (SD 12.4) and for those who reported pain, the average level was 28.9 (SD 9.9). Significant statistical difference ( $p = 0.483$ ) was not observed between the factors pain and anxiety.

**Conclusions:** There was no association between pain and anxiety in patients with MIH.

**Upper Lateral Incisor Agenesis in Deciduous and Permanent Dentition: Case Study**

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**Introduction:** Agenesis of the maxillary lateral incisors (ILS) can cause asymmetries in the patient's smile, causing a negative aesthetic impact. Because they involve the anterior region, patients and their families feel uncomfortable with the diastemas and poorly positioned canines. This aesthetic impact can have psychological and social consequences for patients, especially in childhood.

**Case Report:** Girl, two years and four months old. The mother expressed concern about her daughter smile. Occlusal and periapical radiographs showed the absence of the deciduous teeth 52, 62 and their permanent successors teeth. Considering that the child is very young, it was decided to accompany the development of the occlusion until an ideal period of orthodontic intervention. Guidance on hygiene and oral health were given.

**Discussion:** In cases where aesthetics and function are compromised, orthodontic and prosthetic treatment may be used, however, in young patients, a less invasive approach is critical. There are consequences that may occur in the permanent dentition due to ILS agenesis, such as canine ectopic eruption and Class III development due to maxillary hypoplasia. In the current report, there is a possibility of such complications due to the absence of deciduous and permanent ILS.

**Conclusion:** Anterior agenesis can cause aesthetic, phonetic and functional problems in patients, leading to social impacts. The early diagnosis helps in treatment possibilities and to clarify and calm the anxiety of children and their families.

## Impact of Aesthetic Dental Treatment on the Oral Health-Related Quality of Life of an Adolescent: A Case Report

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**Introduction:** Previous studies have reported that dental treatment may improve adolescent's oral health-related quality of life (OHRQoL). The aim of this case report is to describe an aesthetic restorative dental treatment and its impact on the OHRQoL according to the perceptions of an adolescent and her mother.

**Case report:** A 13-year-old female patient was brought to the Dental Clinic of the Universidad Científica del Sur; Lima, Perú with a chief complaint of poor aesthetics. During clinical examination darkened glass ionomer cement restorations were found on the maxillary and mandibular canines. Maxillary central incisors showed cavities from previous dental restorations and mandibular incisors showed white/creamy opacities. Moreover, white spots areas were observed on the buccal surfaces of posterior teeth which were diagnosed as dental fluorosis. Aesthetic restorative procedures with resin composite were performed. To evaluate changes on the OHRQoL over time, the Parental-Caregiver Perceptions Questionnaire (PCPQ) and the Child Perceptions Questionnaire (CPQ11-14) were administered before dental treatment, and one month after its completion. It was observed a reduction in PCPQ and CPQ11-14 total score, mainly in Emotional Well-Being (EWB) and Social Well-Being (SWB) domains.

**Discussion:** It has been reported that dental treatment impacts positively in the OHRQoL of adolescents. This case report showed that aesthetic dental treatment had a positive impact on EWB and SWB domains probably due to the poor aesthetic that was disturbing the patient.

**Conclusion:** Aesthetic Dental Treatment could influence positively on the OHRQoL according to the perceptions of an adolescent patient and her parent/caregiver.



**Supernumerary Teeth in Non-syndromic Twins: Multiple and Unusual Morphologies**

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**Introduction:** Supernumerary teeth (STs) are the uncommon anomalies of development that may appear in either of dentitions. Numerous theories have been proposed to elucidate this anomaly, including a genetic influence. This study aims to report the diagnosis and treatment of supernumerary teeth in monozygotic twins.

**Case report:** This study describes two cases of monozygotic twin brothers, male, 6-years old, who both presented with multiple supernumerary teeth in the maxilla. The diagnosis came about due to the aesthetic complaint of the first case, due to an eruption of "abnormal tooth." On clinical and radiographic exams, it was possible to discover the presence of mesiodens and another supernumerary element. The second case was his brother, after radiological exams were performed, we found the presence of supernumerary elements in a similar region to his twin brother. Both patients were submitted to 3D tomography and extraction of dental elements.

**Discussion:** It is very rare the occurrence of mirror STs in monozygotic twins, especially multiple teeth. This case report used 3D tomography as a confirmation method, being an important resource for conducting the planning. The extracted dental pieces had similar morphology, showing hypoplasia. It is very important that the diagnosis of supernumerary teeth is early to allow for proper treatment and minimize the possible damages.

**Conclusion:** Through these case reports, it is possible to understand that heredity appears to play an important role in the occurrence of supernumerary teeth. Pediatric dentists play an important role in conducting the diagnosis, planning, and treatment of this rare condition.

### **A Case Report of Idiopathic External Cervical Resorption in a 14 year old Girl**

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**Introduction:** Pathological resorption is often encountered when managing paediatric patients. In the permanent dentition it can lead to sequelae including pain, and early loss of the tooth. One form of pathological resorption is External Cervical Resorption (ECR). Potential aetiological factors include dentoalveolar trauma, orthodontic tooth movement or surgical treatment. This report illustrates a case of ECR of idiopathic origin and management challenges.

**Case report:** A 14 year old known to the restorative team at Guy's and St Thomas' Hospital for treatment of Hypodontia was referred to Paediatric Dentistry with a diagnosis of idiopathic ECR to the UR1. There was no history of dental trauma or any other preceding cause for the ECR. Clinical and radiographic investigations confirmed severe ECR of the UR1. The treatment plan included extraction of the UR1 due to late detection and poor prognosis. The immediate restorative phase involved placement of a removable prosthesis. In the mid-term a resin bonded bridge will be provided and further long term restorative treatment to be coordinated with Hypodontia multidisciplinary team.

**Discussion:** The pathophysiology and treatment planning for ECR remains a challenge for paediatric dentists. Early diagnosis can result in interventions with a more favourable outcome. In this case the UR1 was greatly compromised with a Heithersay classification of 3, therefore treatment options were limited to extraction and replacement.

**Conclusion:** ECR is a rare dental condition with ill understood pathophysiology. This case report highlights the importance of early detection and challenges in treating such cases.

## **Anatomical Microstructure Study of Primary Second Molar with Molar-incisor Malformation using Micro Computed Tomography: A Case Report**

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**Introduction:** The purpose of this article is to report the case of a patient with Molar-incisor malformation(MIM) in the primary second molars.

**Case report:** A 10-year-old boy visited dental hospital with chief complaint of bruxism. He had medical history about bilateral arteriovenous malformation. In panoramic view, MIM morphology was observed in all permanent first molars and both mandibular primary second molars. The mandibular right primary second molar was extracted without any damage to the remaining mesial root and micro CT was used to analyze tooth sample.

**Discussion:** The patient in this case had a history of surgery under general anesthesia with bilateral cerebrovascular disease arteriovenous malformation at 1 year of age, which may be the cause of MIM development. The micro CT analysis showed a cervical mineralized diaphragm (CMD). Complex morphologies such as accessory root canals near the root furcation area, constricted root canals, and root canals furcated near the apical area of the mesial root can be observed.

**Conclusion:** This article reported the case of a patient with MIM in the permanent first molars and primary second molars. Characteristics in the MIM-affected primary second molar were almost similar to those in the permanent first molars with MIM. It is important to carefully examine and manage MIM, especially among patients with MIM in the primary second molar.

### **Minimum Invasive Surgical Removal of Supernumerary Tooth in the Child's Pre-Maxilla Region: A Case Report**

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**Introduction:** Early diagnosis with minimally invasive treatment provides the child patient a reduction in local trauma and stress. The objective of this case report is to present the extraction of a supernumerary tooth in the pre-maxilla region, diagnosed early, with an intervention in a minimally invasive manner.

**Case Report:** Male white patient, 5 years old, attended the school clinic of Dentistry at University Center of Anápolis-UniEVANGÉLICA, complaining of discomfort in the region of deciduous upper incisors. A bulging in the vestibular mucosa with a fistula in tooth 61 was observed clinically and radiographically a mesiodens in the premaxilla region. Immediate extraction of tooth 61 was proposed in order to allow the mesiodens to erupt and therefore avoid its surgical extraction. After five months the mesiodens erupted, and removal was performed under local anesthesia, with infiltration technique in the bottom of the vestibule and palatal complementation, using 2% lidocaine with epinephrine, in a concentration of 1: 100,000. After the syndesmotomy, the tooth was extracted with forceps. Curettage and irrigation with saline solution were followed by simple suture. During clinical follow-up, spontaneous tooth eruption of tooth 21 was observed.

**Discussion:** Early diagnosis and minimally invasive interventions are considered important for infant patients as they reduce possible trauma in the oral cavity that the surgical techniques do.

**Conclusion:** Early diagnosis and correct assessment, are important in reducing local trauma and stress to the child.

### Association between DMH and MIH Lesion Severity

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**Background:** Deciduous molar hypomineralisation (DMH) is predictive for Molar Incisor Hypomineralisation (MIH), however, its association in terms of severity is unknown.

The aim was to assess the severity of DMH/MIH lesions and their possible association

**Methods:** In this cross-sectional study 450 school children between 6-7 years of age from Medellín (Colombia) were evaluated using the MIH/DMH index for scoring lesions severity. Descriptive variables were analyzed using frequency and proportion. Categorical variables by statistical analysis of central tendency and dispersion. Normality was evaluated with the Shapiro-Wilk test. Multivariate analysis of variance (MANOVA) was used for the variables of analytical scope. Hypothesis testing was performed using a 5% significance level, analyses are reported with a 95% confidence interval.

**Results:** The prevalence of DMH/MIH was 26%. The prevalence of DMH was 23.78% and MIH was 25.11%.

Mild defects were more prevalent for both DMH and MIH. Mild defects 2.93% and severe 1.1% for DMD. MIH mild defects 9.82% and severe 1.1%. MIH showed 2.88 higher odds of severe (95% CI 2.41-3.45) when mild DMH was present.

**Conclusion:** Mild DMH could be a predictor for severe MIH.

### **Molar Incisor Hypomineralization: An Overview**

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**Background:** Dental enamel, one of the four major tissues that make up the tooth, is the hardest mineralized tissue. It does not undergo remodeling like bone and as a result the structure of enamel is affected during its development permanently. Developmental defects in the enamel are visible deviations from the normal translucent appearance resulting from damage of the enamel organ during amelogenesis. They are caused by complex interactions between genetic and environmental factors during tooth development. One such enamel defect, causing permanent damage is molar incisor hypo mineralization (MIH).

**Literature Review:** The term Molar Incisor Hypomineralization (MIH), introduced by Weerheijm et al. in 2001 is used to describe a specific pattern of enamel defects. This terminology was definitively adopted by the 6th Annual conference of the European Academy of Pediatric Dentistry (EAPD) in Athens after innumerable discussions.

Weerheijm (2001) defined MIH as `hypomineralisation of systemic origin, presenting as demarcated, qualitative defects of enamel of one to four first permanent molars (FPMs) frequently associated with affected incisors.

MIH creates a new challenge in Pediatric and restorative dentistry, because of high prevalence; notably, 1 in 6 children, and because of treatment challenges to the dentists.

**Conclusions:** Children with poor general health in early childhood or with hypomineralised second primary molars should be considered at risk of MIH. Therefore, should be monitored more frequently during eruption of the FPMs. Management of these teeth should consider their long-term prognosis, as well as management of the presenting features such as pain.

## **Use of Cone Beam Computed Tomography (CBCT) in Management of Multiple Supernumeraries in a Non-syndromic Patient: A Case Report**

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**Introduction:** Multiple supernumeraries (MS) in the premaxillary region are a rare occurrence in non-syndromic patients and can lead to many dental complications. Of the different types of supernumeraries, supplemental type often poses a significant challenge to clinician due to its morphological similarities to the actual tooth. This report highlights the importance of CBCT in the management of a patient with MS.

**Case report:** A 9-year-old healthy boy presented with dentally crowded premaxilla that has seven erupted incisors. Tooth 21 was labially impacted beneath one of the erupted supernumeraries, tooth 22 was palatally displaced, and traumatic crossbite between a supernumerary and tooth 31. CBCT showed four supplemental supernumeraries. The CBCT images helped in deciding on which of the teeth to be extracted and whether or not a surgical intervention is necessary. The identified supernumeraries were extracted under local anesthesia. A month later, spontaneous eruption of impacted tooth 21 noted. The patient had a simple orthodontic treatment with sectional fixed orthodontic appliance to realign the spaced out teeth.

**Discussion:** Clinical examination alone was insufficient to identify which of the seven erupted incisors were the supernumeraries or vice versa. The three-dimensional images of CBCT correctly identified the supplemental supernumeraries based on their root morphology and provided accurate information regarding the location of the impacted tooth 21. The CBCT helped to overcome the limitations of two-dimensional radiograph and prevented unnecessary surgical intervention.

**Conclusion:** CBCT is an important investigative tool which aids clinicians in identification, localization and treatment planning of cases with multiple supernumeraries.

**Perplexity Associated with Oro - Dental Anomalies: Case Series**

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**Introduction:** Oro - dental anomalies are abnormalities of form, function or position of teeth, bone and tissue of jaw and mouth. Majority of these anomalies occur during childhood and can defy the logical explanation at time. These can be isolated or may be a sign of a major defect or manifestations of an underlying disorder or syndrome. Along with genetic component local and systemic factors have a role in their development and can therefore affect both the dentitions. These anomalies show wide variations and can present a different clinical manifestation.

**Case reports:** A case series representing different anomalies such as disturbance of biological chronology i.e neo - natal tooth in a 6 week old , topographic anomaly such as reactive localized inflammatory gingival hyperplasia in a 13 month old, anomalies of union i.e. bilateral maxillary double teeth involving permanent central incisors, dentigerous cyst involving two teeth in the same cystic cavity and non-syndromic oligodontia involving maxillary arch is presented.

**Discussion:** A comprehensive knowledge about the identification and classification of different anomalies is essential in diagnosis and treatment planning. A thorough evaluation of the patient along with medical, dental and familial history followed by clinical and radiographic examination supplemented by laboratory test is essential to establish a diagnosis.

**Conclusion:** Early detection and diagnosis are essential steps in management and treatment planning in these cases. The current report presents a series of cases of Oro - dental anomalies.



### **Evaluation and Comparison of Molar Incisor Hypomineralisation –Treatment Need Index & Molar Hypomineralisation Severity Index in Patients with MIH**

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**Background:** Weerheijm et al in 2001 first introduced the term Molar-incisor hypomineralisation (MIH) and defined it as “hypomineralisation of systemic origin, presenting as demarcated qualitative defects of enamel of one to four permanent molars, frequently associated with affected incisors”. The huge variation in prevalence ranging from 2.4% to 40.2% is due to lack of standardised system for recording MIH. Hence, the need of the hour is to test the applicability of MOLAR INCISOR HYPOMINERALISATION- TREATMENT NEED INDEX(MIH-TNI) which is developed by an international MIH working group for epidemiological screening and monitoring of individuals with MIH by dental practitioners. Till date, MIH-TNI has not been used in any study.

The aim of this study was to evaluate and compare Molar incisor hypomineralisation- treatment need index and molar hypomineralisation severity index in patients with MIH.

**Methods:** This study was done on a sample of 20 patients of 6-12 yrs. with MIH. Visual inspection of teeth without drying them was done. MIH TNI & MHSI was used simultaneously to measure the defect of MIH and the scores were recorded.

**Results:** This study showed that maxillary molars had greater percentage of defect spreading close to pulp along with hypersensitivity as compared to mandibular molars. Incisors had no defect involving pulp.

**Conclusions:** In the present study it was found that MIH-TNI was simple to use and could allow consistent classification of the MIH condition.

Cariology and Preventive Dentistry, Dental Anomalies

### **Caries Management in a Young Child with Learning Difficulties Complicated by Multiple Dental Anomalies**

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**Introduction:** Dental caries is the most common, preventable and non-communicable disease worldwide with dental caries affecting primary teeth ranked 12th in the World Health Organisation Global Burden of Disease Study. Dental morphological anomalies are recognised risk factors that can increase susceptibility to dental caries.

**Case Report:** An eleven-year-old boy was referred by his General Dental Practitioner to the Paediatric Department, University Dental Hospital of Manchester for specialist management of his failing dentition. Relevant medical history included learning difficulties with no reported familial inheritance. Clinical examination identified multiple retained roots, generalised plaque deposits and grossly carious primary and permanent teeth. Additionally, dental anomalies were identified including a talon cusp associated with the permanent maxillary lateral incisor, dens invaginatus on the mandibular premolar and erupted conical supernumerary tooth palatally positioned to the permanent central maxillary incisor. Management involved multiple extractions under general anaesthesia. High caries risk associated prevention was implemented including patient and parental guidance on adapted oral hygiene techniques for the dental anomalies.

**Discussion:** There is an increased prevalence of dental caries in children with learning difficulties. Dental anomalies, especially those affecting morphology, can cause plaque retention and predispose children to dental caries. Proactive and patient-specific preventative advice is necessary for risk mitigation. Moreover, inherited disorders where learning disabilities are one of many features need careful multi-disciplinary management if long-term craniofacial and/or dental development is compromised.

**Conclusions:** Dental anomalies can further increase dental caries risk hence patient and parent education should form a substantial component in prevention plans.

**Association between Frequency and Severity of Dental Fluorosis and Molar Incisor Hypomineralization.**

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**Background:** At the same time as a decrease in the experience of dental caries has been noted, enamel development defects are increasingly evident in clinical practice.

Dental fluorosis (DF) and molar-incisor hypomineralization (MIH) are defects considered as hypomineralization but differ with respect to etiology and clinical characteristics. Up until now, the association between DF and MIH has been little explored in regions with fluoridated salt. The purpose of this study was to evaluate the association between the frequency and severity of DF and MIH in a region with fluoridated salt.

**Methods:** In this retrospective cross-sectional study, we evaluated the buccal, occlusal/incisal, and palatal/lingual surfaces in 453 intraoral photographs of patients aged 13 to 16 years in Colombia. Two calibrated examiners independently evaluated the presence and severity of DF and MIH according to the Thylstrup-Fejerskov (TF) index and the MIH Index (2015). Statistical analyses were performed using a linear generalized model and ordinal logistic regression adjusted by age, gender, and dental caries experience.

**Results:** The frequency of MIH was lower when there was DF (PR = 0.03;  $p = 0.00$ , 95% CI: 0.01-0.08). The severity of the MIH was lower among those who presented a level of DF (aOR = 0.02; 95% CI: 0.01-0.07). Regarding severe DF, there was no significant difference in the severity of MIH ( $p = 0.174$ ).

**Conclusion:** The frequency and severity of MIH tend to be lower when there is DF.

### **Ghost Teeth: An Unusual Case of Regional Odontodysplasia**

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**Introduction:** Regional Odontodysplasia (RO), commonly referred to as “ghost teeth” is a rare, non-hereditary, dental anomaly. Teeth are typically grossly malformed with severe pitting, grooving and a yellow-brown discolouration. Usually, one quadrant is affected. The aetiology of this rare condition is unclear. The dental management is complex, requiring a multidisciplinary team input.

**Case Report:** A 12-year old girl presented to the Paediatric Dentistry Department regarding delayed eruption and malformed teeth in the upper right quadrant. The patient and her parents were concerned regarding the appearance, and denied any history of pain or infection. The patient was fit and well. Clinically, the teeth in the upper right quadrant (UR3-UR7) were severely dysplastic, hypocalcified and impacted. The remaining permanent dentition appeared normal. A diagnosis of RO was based on the clinical, radiographic and histopathological findings. Treatment involved a combination of orthodontic treatment, surgery and restorative treatment.

**Discussion:** Treatment planning in RO is challenging and there is no common consensus amongst clinicians. Aims of treatment are to improve function and aesthetics, facilitate normal jaw growth and minimise the psychological impact of tooth loss. A multidisciplinary team input, involving Paediatric Dentistry, Oral Surgery, Restorative Dentistry and Orthodontics is essential.

**Conclusion:** RO is a rare dental anomaly, with few reported cases in the literature. The aetiology is uncertain; however, a hereditary link has been disregarded due to a lack of familial clustering. This case illustrates the clinical, radiographic and histopathological presentation of RO and the various clinical considerations in the dental management of these patients.

### Importance of Diagnosis and Monitoring of a Patient with Dental Agenesis

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**Introduction:** Dental agenesis is defined as a genetically determined heterogeneous disorder that manifests as the congenital absence of one or more teeth. It is considered a condition of multifactorial origin influenced by genetic, environmental, pathological and evolutionary factors involved in the normal mechanisms of odontogenesis.

**Case report:** 3-year-old male patient, apparently healthy, presented for consultation "to be treated by the teeth". The mother did not report any pathological data upon questioning. The patient presented agenesis of the dental organ 82. Upon radiographic examination, the presence of the dental germ of the permanent tooth was found. Preventive treatment consisted of plaque control, brushing technique, fluoride application and pit sealants. Restorative treatment included resins in OD 74, 54, 84, 63, 61 and 72. Pulp therapies (pulpotomy) were performed in OD 64, 62, 52, 71, 83 and 81.

**Discussion:** Patients with abnormalities may benefit from being diagnosed early and correct treatment to promote correct craniofacial growth.

**Conclusions:** Through an early detection of agenesis, it was possible to provide comprehensive and interdisciplinary treatment and follow-up to enhance development of permanent occlusion.

## **Birooted Primary Maxillary Central Incisors: A Differential Diagnosis for Partially Fused Primary Maxillary Incisors: A Case Series Report**

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**Introduction:** This case series report aims to present the rarely occurring birooted primary central incisors as a differential diagnosis for the more commonly found partial fusion in primary anterior teeth

**Case Report:** 3 children reported with carious primary maxillary anterior teeth. Radiographic examination incidentally revealed root bifurcation in their primary maxillary central incisors. Another child reported with a notched primary maxillary central incisor. His clinical and radiographic findings were suggestive of partial fusion between unilateral primary maxillary central and lateral incisors.

**Discussion:** Fusion is the union of two separate tooth buds at some stage in development. When two teeth unite completely to form a single tooth, it is termed as 'Complete Fusion'. When the crown of adjacent teeth fuse to form a single crown and two roots are separate, it is termed as 'Partial Fusion'. Teeth showing partial fusion in primary anterior maxillary teeth share common radiographic features with the birooted primary maxillary central incisors. However, decrease in the number of teeth, more space in arch and a notched crown are the clinically differentiating features of teeth showing partial fusion and aid in their correct diagnosis.

**Conclusion:** When a primary maxillary central incisor presents two roots or root canals, the differential diagnosis should include 'birooted' central incisors along with fusion and dens in dente. The knowledge of external and internal dental anatomy is fundamental for the proper root canal treatment of these teeth. This study is also suggestive of their increased prevalence and can no longer be considered as 'rare'.

### Hypodontia Pattern in Nonsyndromic Patients

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**Background:** Hypodontia or tooth agenesis is a very common dental anomaly, diagnosed during routine dental examination. However, we have limited data regarding its prevalence among Romanian children. The aim of this study was to investigate and analyze the occurrence and distribution pattern of hypodontia in nonsyndromic young patients examined in the Pediatric Dentistry Department, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy in Timișoara.

**Methods:** 131 children, aged 5 to 13, were included in the study. The patients presented for various dental reasons, they were clinically examined and OPG radiographs were taken for each case. The data was analyzed according to age, number of missing teeth and the pattern of distribution. Hypodontia was diagnosed based on clinical signs, radiographic signs (the absence of coronal calcification) and medical history (lack of evidence of loss due to caries, periodontal problems or trauma). The data was then statistically analyzed.

**Results:** From a total of 131 OPGs, 18 (13,74%) showed one or more congenitally missing teeth: six cases with maxillary, fourteen cases with mandibular, and two cases with bimaxillary hypodontia. Contrary to the literature, which attributes a higher occurrence to the upper lateral incisor hypodontia, this study found that the lower second premolar hypodontia was more frequent and most times, it was bilateral. In only one case all second premolars were missing.

**Conclusions:** Hypodontia showed a rather high occurrence in our study. An early diagnosis allows for an appropriate therapeutic decision regarding the space management, to prevent future complications.

### **Quality and Readability of Web content on Ankyloglossia using the DISCERN tool and Flesch Readability Scale**

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**Background:** Tongue-tie or ankyloglossia is a congenital anomaly that causes restriction of tongue movements. Parents of children with ankyloglossia are most worried as it affects speech, breast feeding, deglutition etc. Patients and the general public often search online to understand such conditions. The information online is largely unregulated and hence a review of websites would enable patients to have a clear picture of such congenital anomalies.

The purpose is to assess the quality and readability of online information on ankyloglossia by evaluating websites using the DISCERN instrument and the Flesch reading ease (FRE) scale.

**Methods:** An Internet search was done using Google search engine with relevant search terms. The first 50 sites from the search engine were screened and the DISCERN instrument was used to assess the quality of the information and readability was assessed using the Flesch reading ease (FRE) scale.

**Results:** The DISCERN quality scores ranged from 31 to 66 (Mean = 45.5, SD = 8.14) with 14% and 52% categorized a Good and Fair. FRE scores ranged from 27 to 67 (Mean = 41.9, SD = 14.14) representing difficult readability.

**Conclusion:** The internet information on ankyloglossia is incomplete, complex and poorly organized. Thus it varies in quality and readability. Information on treatment risks and benefits need to be more accurate so as to get a clear picture and ease their anxiety before visiting the clinician.



### Anticipatory Guidance for Hypomineralized Molars Reconstruction: A New Proposal

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**Introduction:** Molar-incisor hypomineralization (MIH) is a qualitative defect of enamel affecting one to four-first permanent molars. The lower strength of the enamel can undergo post eruptive breakdown. The faster the lost enamel structure is restored, the lower the risk of developing caries and less chance of pain. The aim of this report is to propose an anticipatory guidance for hypomineralized molars reconstruction to facilitate and speed up the restorative procedure.

**Case report:** This technique is indicated for MIH affected molars with no enamel loss, during their eruption into the oral cavity. The first step is to make the differential diagnosis and record the child's data. The second step is to apply petroleum jelly on the occlusal surface (that might be completely exposed), cover this area with bulk fill composite resin, and after light curing, the result will be a perfect copy of the occlusal surface, that might be used as resin matrix. The last step is to disinfect and store the resin matrix individually and identified. In case of sequent enamel loss due to occlusal forces, this resin matrix might be filled with glass ionomer cement or composite resin to restore the tooth.

**Discussion:** This procedure has the advantage of being fast, easy and able to reproduce the original anatomy of the tooth. In addition, the materials used to make the guidance are used by most professionals.

**Conclusion:** The present report showed the proposed procedure is an anticipatory guidance for hypomineralized affected molars that can facilitate restoration in cases of sequent enamel loss.

### Vitamin D Deficiency Causing Delayed Eruption of Primary Teeth

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**Background:** Delayed tooth eruption might be the primary or sole manifestation of local or systemic pathology. Nutritional deficiencies have shown to cause a disturbance in eruption. The purpose of this study aimed to assess vitamin D deficiency among infants and to correlate it with delayed eruption of primary teeth. In addition, the association between socio economic status, infant's sun exposure, maternal sun exposure during pregnancy and religion on the vitamin D status was also assessed.

**Methods:** A questionnaire was distributed to parents to gather information on religion, sun exposure of mother and infant and socio economic status. A cross-sectional, observational study conducted on 96 infants aged 12-15 months after obtaining consent. Blood samples were assessed for vitamin D3 levels using the vitamin D ELISA Kit. The eruption status of the teeth was recorded in all the 96 infants. The obtained data was subjected to statistical analysis.

**Results:** A significant correlation in the vitamin D levels and the eruption timing ( $p < 0.001$ ). The difference in mean vitamin D levels among the three socio economic groups was not statistically significant ( $p = 0.088$ ). A significant association was found between the infant's sun exposure and mother's sun exposure during pregnancy and religion on the vitamin D levels ( $p = 0.002$ ,  $p = 0.042$ ,  $p = 0.002$ ).

**Conclusions:** Vitamin D deficiency can be considered as an etiological factor for delayed eruption. A strong association exists between socioeconomic status, infant's sun exposure, maternal sun exposure during pregnancy and religion with vitamin D levels.

**Parents` Knowledge about MIH and its Treatment Possibilities: Preliminary Findings**

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**Background:** The possibilities for treating teeth with molar-incisor hypomineralization (MIH) are diverse and the decision regarding the best approach should be made individually, considering the age of the patient and the severity of the condition, as well as the expectations of the child and parents. This study assessed the parents` knowledge and perception regarding MIH and its treatment possibilities.

**Methods:** A total of 34 parents of children evaluated at the pediatric dentistry clinic participated in the study. Initially, the REALMD-20 health literacy test was applied, and then the parents answered the questionnaire about MIH. Next, the parents watched an explanatory video about MIH and its treatment alternatives to answer the knowledge questionnaire again. At the same time, another questionnaire with clinical cases of MIH at different severities was applied to choose the treatments that they considered the best option.

**Results:** The results showed that health literacy did not impact the total number of correct answers in the knowledge questionnaire or the treatment ( $p=0,050$ ). Regarding knowledge about MIH, parents got more questions correct after watching an explanatory video ( $p=0,001$ ). However, there was no correlation with greater accuracy in questions related to the treatment of anterior (75%) and posterior teeth (39%).

**Conclusion:** It is concluded that the parents initially had little understanding regarding MIH. After receiving information, they were relatively able to absorb the knowledge and distinguish the difference between possible treatments according to severity observed.

**Molar Incisor Hypomineralization: Challenges in the Restorative Treatment in Pediatric Dentistry**

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**Background:** Children with molar incisor hypomineralization (MIH) may have impaired quality of life. These patients frequently report painful sensitivity and complacency regarding the appearance of their teeth. The aim of this study was to conduct a literature review on the challenges involved in the aesthetic and functional restorative treatment of the MIH condition.

**Literature review:** HMI is defined as a systemic-induced hypomineralization that affects one-four permanent first molar teeth and is usually associated with the incisors. Dental enamel becomes more porous and fragile, which can lead to a structural loss. Several etiological factors seem to be involved, including genetic and environmental influences. Regarding the clinical appearance, the lesions may appear whitish even in brown, with a well-defined border, and extensive enamel breaks may occur. Glass ionomer, resin-modified ionomer and composite resin, are the most frequently materials used for the restorative treatment. Non-invasive procedures are chosen to cover and protect hypersensitive and hypomineralized tissues. Another option to protect the fragile enamel is the prefabricated metal crown, however it has aesthetic limitations. On the other hand, more aesthetic techniques require invasiveness in cavity preparation, which seems to be related to a greater durability. In addition, the patient's age, painful sensitivity, enamel quality, aesthetic and durability results must be considered in the restorative approach.

**Conclusions:** The restorative treatment of the MIH condition is still a challenge in Pediatric Dentistry. More randomized clinical trials are required to guide the dental clinical practice in relation to the restorative treatment of this condition.

**‘My Green Teeth’**

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**Introduction:** Metabolic disorders may cause intrinsic tooth discolouration and enamel defects.

**Case Report:** A 5-year-old girl with chronic liver disease was referred for dental assessment. She was cholestatic during neonate and had undergone liver transplant. She presented with generalized intrinsic discolouration secondary to liver disease, multiple dental caries, generalised hypomineralised enamel with post-eruptive breakdown and tooth surface loss. Her mother was also concerned that the discolouration may affect the permanent dentition. Tailored preventive regime was carried out. Treatment was undertaken under general anesthesia due to the extent of dental disease and complex medical history requiring antibiotic prophylaxis. At her six months' post-operative review, the mandibular first permanent molars and maxillary and mandibular permanent central incisors were erupting and presented with greenish intrinsic discolouration. Long-term management will include a combination of external bleaching and composite-resin veneers.

**Discussion:** Patients with liver disease are likely to present with intrinsic green discoloration of teeth and soft tissues due to hyperbilirubinemia. The green pigmentation is an alteration that occurs in the dentine during the calcification process. Due to lack of metabolic activity in dental hard tissues, the green pigment is trapped and permanently discolours the tooth. The patient underwent transplant at the age of 3 years, which implies that the development of the FPM, incisors, canine and premolar tips will be affected.

**Conclusion:** It is important to understand the effect of metabolic disorders on the developing dentition in order to offer appropriate counselling to young patients and their carers as well as plan long term-management.

**Agenesis of Permanent Lateral Incisors and its Association with the Hereditary Factor: Clinical Case**

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**Introduction:** There are various dental anomalies with defects in tooth development, precipitated by hereditary, systemic, traumatic or local factors. Hypodontia or congenital dental absence represents a deficiency in the number of teeth. The pattern of family inheritance is the cause of the greater etiological correlation.

**Case report:** A 9.3-year-old female patient attends the UAEMex Pediatric Dentistry Clinic, for the reason "her teeth are missing". She has a family history of a maternal grandmother with permanent lower lateral agenesis and an older brother with a compound odontoma. A clinical history is taken and on questioning the systems the patient is apparently healthy. An intraoral examination was performed and complementary studies such as orthopantomography were requested. Dental management was performed through a preventive, restorative and maintenance treatment plan, as well as referral to the Orthodontic Service.

**Discussion:** In the global proportion, an incidence of 1.5-10% has been identified. The tooth that is generally absent is the 2nd premolar (3.4%), followed by the lateral incisor (2.2%), with women being the most affected. The bilateral presentation of agenesis is constant in almost all affected cases.

**Conclusion:** Dental agenesis is a clinical condition of great interest in our practice and at the same time it is a challenge to further understand its genetic characterization. It is vitally important to perform an adequate anamnesis, including a family history of congenital absence of teeth or other types of abnormalities.

### Specialist and Transitional Care Provision for Amelogenesis Imperfecta: A UK Wide Survey

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**Background:** The impact of Amelogenesis Imperfecta (AI) includes functional, aesthetic and psychosocial problems, in addition to difficulties providing effective treatment. Specialist Paediatric Dentistry input is often essential, with subsequent transition to appropriate, local adult services.

The purpose of this project was to assess the provision of specialist care and transitional care arrangements for paediatric patients with AI in the UK.

**Method:** An online survey was created by members of the National AI Clinical Excellence Network. It was disseminated electronically to members of the British Society of Paediatric Dentistry in January 2020; a two-month period was allowed for completion.

Descriptive analysis was used to interpret the results and a single-handed reviewer completed Interpretative Phenomenological Analysis of the qualitative data.

#### Results:

- 115 clinicians across all four nations participated in the survey.
- Most respondents (54% n=66), were based in the Hospital Dental Service.
- Overall, 29% (n=33) were Consultants and 24% (n=28) were Specialists in Paediatric Dentistry, respectively.
- The most common AI patient age group seen was 6-12 years old.
- No clear AI referral pathway into specialist care was reported by 49% (n=47) of respondents.
- A clear transitional care pathway was deemed not to exist by 77% (n=72) of respondents.
- Qualitative analysis revealed themes including 'Unclear care pathways,' and 'Specialist care access problems.'

**Conclusion:** Access to specialist paediatric care and transition to adult services is not readily available throughout the UK for AI paediatric patients. There is a clear need to establish and improve existing care pathways.

**Ectodermal Dysplasia in Pediatric Dentistry: A Female Case Report**

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**Introduction:** Ectodermal dysplasia (ED) is a hereditary condition associated with changes in one or more ectodermal derivatives, which are inherited as a cross-linked recessive trait so that the frequency and severity of the condition is more likely to occur in males than in females. ED causes hypodontia, dystrophic nails, sparse hair, dental anomalies (anodontia), dry skin and absence of eyelashes. For its diagnosis a detailed anamnesis must be performed.

**Case report:** A female patient with ectodermal dysplasia with 9 years and 11 months old attended the Children's Clinic of the Department of Pediatric Dentistry for her first appointment. The child had some of the characteristics of low-expressive hypohidrotic dysplasia. During the anamnesis the mother reported a history of other family members, on the maternal side, also affected. She also had poor oral hygiene and sucrose intake was excessive.

**Discussion:** The identification of this syndrome, its diagnosis and option for an appropriate treatment is very important to restore the child's self-esteem. The aesthetic impairment of this syndrome can lead to bullying at school. The presence of changes in this anomaly, rare in females, demonstrates the importance of pediatric dentists in promoting health and quality of life for these patients.

**Conclusions:** Oral manifestations, especially dental anomalies, are common in ED. The presence of this syndrome in girls is not common, so the pediatric dentist must be prepared to diagnose and treat these patients in a multidisciplinary way, in order to promote health and provide psychological conditions for their insertion in the community.



Dental Anomalies, Dental Materials, Restorative Dentistry

### **The Aesthetic Restoration of Missing Anterior Teeth and Maxillary Polydiastema with Composite Mock-Up Technique and Fiber Bridge**

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**Introduction:** Mock-up technique and fiber bridge are frequently used techniques in the last years in order to fulfill patients' aesthetic needs. Mock-up technique is a bio aesthetic approach for the excessive material loss in the teeth, missing of the teeth, and congenital aesthetic defects and it is used for both diagnosis and aesthetic treatment. Fiber bridges are successfully applied especially for the missing single tooth. In that case report, it is aimed to present the aesthetic treatment using mock-up technique and fiber bridge in a child patient having missing anterior teeth and maxillary polydiastema not treated by orthodontic treatment before.

**Case report:** The oral examination of a 14 year-old male patient consulted at Atatürk University Faculty of Dentistry Department of Pediatric Dentistry for aesthetic reasons was performed. The orthodontic treatment of the patient who has polydiastema and missing single tooth had been completed before. A model was produced after getting measurements from the patient. The silicon key produced from the model was used as a guide and the diastemas were closed by composite resin. After that, the fiber bridge was positioned for the missing tooth.

**Discussion:** Diastemas and tooth deficiencies in the anterior region can lead to aesthetic problems. Direct composite restorations and fiber bridges have long been used in the treatment of aesthetic problems, giving aesthetic and clinically acceptable results.

**Conclusion:** Direct composite restorations and fiber bridges can be preferred in patients with diastema and tooth deficiency due to their easy application and ability to meet aesthetic and economic requirements.

## **The Relevance of Cone Beam Computed Tomography in the Management of Dens Invaginatus: A Case Report.**

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**Introduction:** Dens invaginatus (DI) is a rare developmental anomaly involving infolding of the enamel organ into the dental papilla causing formation of dead space within a tooth. Incidence rates vary from 0.3%-10% in adult teeth with maxillary lateral incisors most commonly affected. Often linked with pulpal involvement, management can pose challenges owing to its complex endodontic anatomical variation.

**Case Report:** A male patient, aged 14, was referred to the paediatric department for continued complex endodontic treatment associated with the left maxillary lateral incisor (UL2). While clinical evaluation demonstrated no morphological variations, an attempted access cavity was evident, palatally. A periapical radiograph and cone beam computed tomography (CBCT) illustrated an enamel lined invagination positioned and extending through the coronal root. Communicating laterally through a pseudo-foramen with adjacent PDL widening, a diagnosis of Oehlers type IIIA DI with chronic lateral and periapical periodontitis was reached. Extraction of the UL2 and immediate replacement with a partial denture was carried out, followed by definitive placement of a resin-bonded bridge once bone remodeling had stabilized.

**Discussion:** Clinical and plain intra-oral radiograph findings resulted in suspected DI, alongside a somewhat hopeful prognosis following completion of treatment. However, further investigation of the internal root canal anatomy through the use of CBCT led to a drastic change in the management plan; reinforcing the importance of comprehensive radiologic evaluation supported by different imaging techniques.

**Conclusion:** Early identification, prompt referral to specialist care and appropriate investigations including the additional aid of CBCT are essential during the management of DI.

### Current Trends in the Management of Molar Incisor Hypomineralization

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**Background:** Molar incisor hypomineralization (MIH) is a common qualitative enamel defect with a global prevalence of 14.2 % [1] and can carry a heavy treatment burden for many patients. The available treatment modalities are extensive - ranging from prevention and restoration to extraction.

**Literature review:** The management of MIH is challenging as the clinical appearance and individual treatment needs differ widely. A variety of treatment options are available, and the clinical decision making depends upon the severity of the lesions, the number of teeth involved, and symptoms of the affected tooth. Topical fluoride, in the form of varnishes or gels, can help remineralize enamel and reduce sensitivity. Similarly, SDF has gained popularity as a desensitizing and remineralizing agent. The recommended minimally invasive treatment techniques include CPP-ACP (Casein phosphopeptide–amorphous calcium phosphate complexes in pastes), enamel micro-abrasion, the etch-bleach-seal technique, and resin infiltration, all of which can be used either alone or in combination. Hybrid restorations consist of high strength glass hybrid restorative and wear-resistant, self-adhesive, with a light-cured resin coating. Deproteinization using 5% NaOCl can be used on MIH affected teeth to increase the retention of composites. CAD/CAM fabricated ceramic restorations may be used for teeth with multi-surface lesions.

**Conclusion:** Management tends to be difficult once enamel breakdown occurs, as they are case dependent and may pose various individual considerations. It is important that MIH is diagnosed early, as this ensures that appropriate treatment can be provided in optimum time.

[1] Wall A, Leith R. Contemporary management options for molar incisor hypomineralization. Journal of the Irish Dental Association. 2020 Feb 1;66(1).

**Tooth- Order, Disorder or Difference**

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**Introduction:** A supernumerary tooth is one that is additional to the normal series and can be found in almost any region of the dental arch. They are classified according to their form and location. Their presence may give rise to a variety of clinical problems.

**Case report:** Here, we report the case of a 12-year old boy who presented with a complaint of a missing upper front tooth. At the 1-year follow-up to check the exfoliation of the primary tooth, the radiographic findings revealed the presence of a diagonally impacted 21 with the presence of a tooth-like structure beneath, suggestive of supernumerary teeth. This was treated with a multidisciplinary approach, which resulted in eruption of the 21.

**Discussion:** Detection of supernumerary teeth is best achieved by thorough clinical and radiographic examination. Their management should form part of a comprehensive treatment plan. The most common supernumerary tooth appears in the anterior maxillary midline followed by lower bicuspid region.

**Conclusion:** The present report showed consistent and successful results of surgical extraction of supernumerary teeth which may serve as an option of treating difficult impacted incisors in growing patients.

**Restorative Treatment in adolescents with Generalized Amelogenesis Imperfecta: Case Report**

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**Introduction:** Amelogenesis Imperfecta (AI) is a genetic alteration with a hereditary characteristic that affects enamel formation through improper differentiation of ameloblasts. The existence of a diversity of materials and restorative methods expands the treatment possibilities. This work is to make a case report of the treatment of an adolescent patient with generalized AI.

**Case report:** Female patient, 13 years old, arrived at the clinic complaining about the aesthetic appearance of the restorations of the upper anterior teeth and that all the teeth were yellowed and stained, she couldn't smile, because she was ashamed, discomfort when eating, dental sensitivity when eating hot and cold foods and was unable to brush my teeth due to sensitivity. In the clinical examination, brownish-yellow spots were observed on the surfaces of all teeth, except teeth 11, 12, 21 and 22, which presented unsatisfactory restorations, resulting in a serious aesthetic and functional compromise. Rehabilitation was performed on composite resin with conventional technique on the upper and lower anterior teeth preceded by gingivoplasty, between sessions, fluoride varnish was applied. The result generated great patient satisfaction.

**Discussion:** Historically, patients with AI were treated by means of extractions and using fully removable dentures. However, it is possible to restore esthetics and function to an acceptable level that can positively affect the patient's self-confidence and behavior nowadays.

**Esthetic Management of Fused Primary Anterior Teeth: A Case Report**

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**Introduction:** Developmental anomalies of teeth are frequently encountered in the pediatric clinical dental practice and present with various challenges to the pediatric dentist. One such anomaly is `fusion` of anterior teeth. These anomalies can lead to high caries risk, unesthetic appearance, delayed or ectopic eruption of the permanent successor or malocclusion. Early identification, prompt treatment and esthetic rehabilitation of such anomalies is important for proper dento-skeletal form and psychological development of the child. The purpose of this case report is to present a case of fused primary maxillary central and lateral incisors and its effective management.

**Case report:** A 4-year-old male child patient reported with a chief complaint of pain and carious teeth in the maxillary anterior region of the jaw. Intra-oral and radiographic examinations indicated that the left primary central and lateral incisors were fused. An OPG was advised to identify similar anomaly in the permanent successors. The primary teeth were pulpectomised and restored using glass-ionomer cement. A small groove was made between the fused teeth to make them separate entities. The teeth were then restored esthetically using composite strip crowns. A 12 months follow-up revealed complete retention of the esthetic restoration.

**Discussion:** Esthetic management of fused anterior teeth helps with self-esteem of the young child. It also minimizes harmful habits like tongue thrusting and maintains the normal growth of the jaws. The permanent successors require timely evaluation and if needed, correction in future.

**Conclusion:** This report shows a successful management of fused primary teeth with esthetic rehabilitation.

**Role of Pedodontist in the Management of Cleft Lip and Palate Patients**

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**Background:** Cleft lip and palate is one of the most common anomalies found due to some unknown disturbances during embryogenesis. The etiology is attributed to genetic and environmental factors. The incidence ranges from 1 in 800 births to 1 in 1200 births. The management of cleft lip and palate patients requires an efficient multidisciplinary team.

**Literature Review:** This poster deals with the types of cleft lip and palate and the management of the patients by a pediatric dentist by review of literature. The pediatric dentist provides supportive care, maintaining oral hygiene, behavioral and preventive management and following the patients from the primary dentition period to the transition to permanent dentition with interceptive treatment procedures.

**Conclusions:** The pediatric dentist plays a dual role in improving the personal impact as well as improving the surgical outcome. Pediatric dentists play a key role in providing continuing, high quality and preventive dental care.

### **Environmental Factors in the Prenatal and Postnatal Period May be Related Molar Incisor Hypomineralization**

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**Background:** Molar Incisor Hypomineralization (MIH) is defined as a qualitative enamel defect caused by disruptions occurring during different stages of amelogenesis. The purpose was to evaluate the clinical characteristics of MIH and determine whether risk factors during the pre and postnatal period may be involved in its development in a cohort of pediatric patients.

**Methods:** This retrospective study was conducted with a cohort of 178 patients (90 with MIH / 88 without MIH) with mean ages of 9.5 ( $\pm 2.5$ ) and 9.9 ( $\pm 1.5$ ) years, respectively. Data collected included the child's medical history and the mother's health during pregnancy. MIH diagnosis was based on the criteria defined by the EAPD. Chi-square tests and odds ratio calculations were performed to determine of the risk factors contributing to MIH, with a significance level set at 5%.

**Results:** A total of 447 teeth were affected by hypomineralization signs, where 46% (n=208) were first permanent molars, 19.4% (n=87) were permanent incisors and 14% (n= 65) were second primary molars. Most teeth (n=324) were affected by mild hypomineralization defects. There was a statistically significant difference between individuals with and without MIH ( $p \leq 0.001$ , OR = 3.17; 95% CI = 1.17-5.6.;  $p=0.012$ , OR= 1.95; 95% CI=1.33-3.75 respectively), related to medication taken up to 4 years old and intercurrents during pregnancy, but there was no association with degree of MIH severity and risks facts ( $p > 0.05$ ).

**Conclusions:** The study suggests that environment factors in the pre and postnatal period may be related to development of MIH in children.



## **Radiographic Dental Abnormalities in Onco-Hematological Patients in Childhood and Adolescence: A Systematic Review with Meta-Analyses**

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**Background:** Leukemia is one of the most frequent hematological diseases in children and adolescents. Chemotherapy and radiation are forms of treatment for leukemia and affect normal cells, causing defects in tooth development. Therefore, dental treatment must be performed before these patients become immunocompromised. This study systematically reviewed radiographic changes and late effects on tooth development in hematological cancer survivors.

**Methods:** studies with patients in remission period after chemo-and radiotherapy treatment were included, after the initial search in Pubmed, Cochrane Library, and Web of Science databases, between 01/01/1975 to 12/31/2019. Of the 1,006 results, 17 eligible studies were identified and included, according to the inclusion criteria. Meta-analysis was conducted calculating the odds ratio between treated and control groups for hypoplasia, microdontia, root growth delay, and agenesis. Fixed and randomized effects models were used and heterogeneity, effect size, and detection of publication bias analysis were evaluated.

**Results:** the survivors had adverse consequences related to cancer or its treatment. There is strong evidence to support the association between antineoplastic therapies and dental development abnormalities, including hypoplasia [OR: 6.07; 95% CI, 2.02 - 18.19] microdontia [OR: 5.90; 95% IC, 1.28 - 27.2], root growth delay [OR: 26.74; 95% IC, 2.09 - 341.83], and agenesis (no difference).

**Conclusion:** this systematic review with meta-analysis demonstrated, with a strong level of evidence and a high degree of scientific quality, that antineoplastic therapies in hematological cancer survivors in childhood interfere with tooth development, resulting in defects such as agenesis, microdontia, hypoplasia and root disturbances.

### Diagnosis and Treatment of Supernumerary Teeth in Patient with Mixed Dentition

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**Introduction:** One of the most common dental anomalies is the presence of supernumerary teeth. Mesiodens are the most common, localized at the maxillary midline. Some of the complications of mesiodens is crowding, delay eruption, cyst lesions, and rotation. The etiology of supernumerary teeth may be related to the hyperactivity of the dental lamina, however, they have also been attributed to hereditary patterns.

**Case report:** A male patient 8 years old was referred to the Pediatric Dentistry Clinic of Universidad Latinoamericana, Mexico. The diagnosis was bilateral mesiodens, one unerupted and one erupted, both interfering with the eruption of the upper central incisors. The treatment was the extraction of both mesiodens due to the crowding and the interference they were causing. The erupted mesiodens was extracted by debriding the gingiva and extracting it with a forceps and for the unerupted one, the gingiva was cut with a scalpel and an osteotomy was performed. The procedure was performed with behavioral management without the need for sedation.

**Discussion:** Mesiodens can be vertically positioned, in normal or inverted position. When the presence of a supernumerary is found, the recommended procedure should be extraction, as long as it does not impair the adjacent teeth's root development.

**Conclusion:** The early diagnosis and intervention of mesiodens is based on clinical criteria. It is important for the pediatric dentist to identify this dental anomaly and to intervene at the right time.

**Etiological Factors of the Midline Diastema in Children Younger than 12 Years Old: A Systematic Review**Sivakumar Nuvvula<sup>1</sup>, Saravani Eaga<sup>1</sup>, Sreekanth Kumar Mallineni<sup>3</sup>, Yong Chen<sup>2</sup><sup>1</sup>*Department of Paediatric and Preventive Dentistry, Narayana Dental College and Hospital, Nellore, Andhra Pradesh, India*<sup>2</sup>*Department of Stomatology, School of Medicine, Xiamen University, Xiamen, Fujian, China*<sup>3</sup>*Preventive Dental Science, College of Dentistry, Majmaah University, Al-Zulfi, Riyadh, Saudi Arabia*

**Background:** Midline diastema in children is a prevalent developmental entity, and this pathological condition may remain in many children due to various factors. Nonetheless, the evidence on etiological factors of the midline diastema in children is minimal. The purpose of the study was to evaluate the etiological factors of midline diastema causes in children below 12 years of age from the published data.

**Methods:** A literature search was confined to the English language using MeSH terms conferring to PICO format in PubMed, Cochrane Library, and Ovidsp covering the period from January 1960 to December 2019. Search in Google Scholar, grey literature, and hand search on references was performed to find additional data. Suitable studies were selected based on the predefined inclusion and exclusion criteria. Quality analysis of the chosen studies conducted using the Newcastle-Ottawa Scale (NOS) adapted for cross-sectional studies.

**Results:** Only eight studies were available for final analysis among those four studies from India, two studies from Korea, one study from Brazil, and on a study from Canada. The most common etiology for midline diastema was supernumerary teeth followed by morphology labial frenum and nasal airflow condensation. The quality analysis of these studies based on NOS showed one study with unsatisfactory, four studies with satisfactory, and three with good quality.

**Conclusion:** Morphology of the frenum, pre-maxillary supernumerary teeth, and nasal airflow condensation seem to be the most common causes of midline diastema in children below 12 years.

### **Hypomineralization of Primary Second Molars and Canines in Preschoolers Participants of a Preventive Dental Program: A Case Report**

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**Introduction:** Hypomineralisations are defects that occur because a disturbance during mineralization and maturation of dental enamel, generating permanent defect in tooth structure. In primary dentition, the hypomineralization in second molars (HSPM) and canine (HPC) are a very specific type of developmental defect of enamel (DDE) that the etiology is still unclear.

**Case Report:** This case report is about four preschoolers, 2 boys and 2 girls, with HSPM and HPC that have been identified by a preventive dental program at Pediatric Dentistry Specialties Center, State University of Londrina, Brazil. The DDE evaluation was evaluated according to European Academy of Pediatric Dentistry and FDI World Dental Federation criteria. All patients presented hypomineralization with different degrees of severity. All patients reported frequent episodes of high fever and the use of antibiotics, anti-inflammatories and antihistamines from 3 to more than 10 times in the first 3 years of life.

**Discussion:** Despite the unclear etiology of hypomineralizations, it could be related to multifactorial origins. Childhood illnesses are highlighted among the possible causes of HSPM and HPC. The frequently episodes of infectious processes and high fevers in the first year of life could be associated with the presence of DDE in the primary dentition.

**Conclusions:** Early diagnosis of hipomineralization in primary dentition is important for appropriate treatment, improving the quality of life of patients, and identify risk groups for similar defects in permanent teeth.

# ***Dental Materials***

### **Inhibition of Matrix Metalloproteinase Activity via a Novel SMART Composite Versus Commercial Filling Materials**

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**Background:** Matrix metalloproteinase (MMP) is an enzyme responsible for the degradation of dentine collagen fibrils, leading to interface microleakage. We developed a new antibacterial, remineralising, self-repairing and sealing composite, SMART, that restores primary teeth painlessly. This study aimed to quantify MMP activity at the surface of demineralised dentine following sealing by SMART composite versus commercially available restorative materials.

**Methods:** 2mm thick sections of coronal dentine from sound human molars, obtained following ethical approval, were fully demineralised through 4M formic acid immersion for 48hrs. Following green fluorescent probe application (EnzCheck Collagenase Assay Kit) for 5 minutes, restorative materials were applied on one surface. Materials included SMART (Schottlander), 3M ESPE Filtek Z250, ACTIVA KIDS Bioactive compomer (+OptiBond Solo Plus adhesive) and GIC Fuji IX, according to the manufacturer's instructions. Non-restored dentine was used as control. Samples were stored in deionised water and incubated at 37°C. Following 1 or 14 days, samples (n=4) were sectioned, and the interface area imaged using Confocal Light Scanning Microscopy (CLSM). The percentage area of green fluorescence in sections 260x260µm<sup>2</sup> MMP activity was determined through ImageJ.

**Results:** SMART restoration had the least fluorescence initially (0.5%), which after 14 days almost totally disappeared. Z250 and ACTIVA results were similar after incubation at day 1 (2.5%-2.0%) and day 14 (2.0% 1.8%) respectively. MMP activity of GIC (Fuji IX) was lower than Z250 and ACTIVA on day 1; however it was significantly higher at day 14, reaching 3.5%.

**Conclusion:** Sealing of demineralized dentine by SMART composite substantially reduced MMP enzyme activity. We have shown that the novel SMART composite can be an effective option in restoring carious primary teeth.

## M1 and M2 Macrophages Phenotypes Modulation after Stimuli with Different Materials used in Endodontic Treatment

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**Background:** Macrophages are phagocytic cells, that have considerable morphological, functional and marker expression heterogeneity. Depending on the microenvironment to which the monocytes and their progenitor cells are exposed, their phenotype is defined as "classically activated" (M1) or "alternatively activated" (M2). M1-macrophages mediated pathogen resistance, presenting antimicrobial and anti-tumor activities, high nitrogen and reactive oxygen production, promoting Th1 responses. On the other hand, M2-macrophages modulate inflammatory response and wound repair. The aim of this study was to evaluate the M1 and M2 macrophage modulation after stimuli with different materials used during endodontic treatment.

**Methods:** After bone marrow-derived macrophage cells were exposed to five endodontic sealers (AH Plus<sup>TM</sup> Sealapex Xpress<sup>TM</sup>, Endosequence<sup>TM</sup>, BioRoot<sup>TM</sup>, Endomethasone<sup>TM</sup>) and a calcium hydroxide-based paste, qRT-PCR and Luminex<sup>®</sup> was used for identification of M1- and M2-macrophages. For normal values, the ANOVA test was used, followed by the Tukey post-test. For non-normal values, the Kruskal-Wallis test was used. All data were analyzed using GraphPad Prism 7.0a software ( $\alpha=5\%$ ).

**Results:** BioRoot<sup>TM</sup> RCS and EndoSequence BC Sealer<sup>TM</sup> stimulated the highest expression of markers for M1-macrophages, while calcium hydroxide-based paste stimulated the lowest expression of these gene markers. For the M2 protein marker, BioRoot<sup>TM</sup> RCS presented the highest stimulation, while calcium hydroxide-based paste also presented the lowest stimulation.

**Conclusion:** It was concluded that the evaluated materials increased the genetic expression of pro- and anti-inflammatory markers. However, this process did not induce the inflammatory response polarization, resulting in a hybrid macrophage.

## Antibiotics Mixture in Non-Instrumented Endodontic Treatment of Necrosed Primary Molars: A Systematic Review

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**Background:** The non-instrumentation endodontic treatment for necrotic primary teeth using topical application of mixture of three antibiotics; the metronidazole, the minocycline and the ciprofloxacin has been proposed. This mixture is used to sterilize infected necrotic pulp and root dentin in primary teeth. However, the presence of minocycline can lead to discoloration, thus it was necessary to investigate the efficacy of a substitute mixture. The aim of the present review was to evaluate the efficacy of different antibiotic mixtures in non-instrumental endodontic treatment of primary teeth with necrotic pulps.

**Methods:** Electronic databases including Medline (via Pubmed), the Cochrane Library (Central) and Scopus database. Only randomized clinical trials, evaluating the clinical and radiological outcomes of topical antibiotics used in non-instrumental endodontic treatment of primary teeth with necrotic pulp of healthy children were selected.

**Results:** After the full text analysis, four articles comparing the outcomes of three different drugs combination were included. The 3 mixture combination, the ciprofloxacin-minocycline-ornidazole combination, the ciprofloxacin-trinidazole- minocycline combination, and the ciprofloxacin-metronidazole-clindamycine combination showed 100% clinical success, whereas, radiographic success rate of ciproflaxacin-minocycline-ornidazole mixture was higher than the 3 mixture combination which was higher than the ciprofloxacin-trinidazole-mnocycline and the ciprofloxacin-metronidazole-clindamycin groups.

**Conclusion:** On the basis of the overall success rates, several antibiotics pastes can be used effectively in non-instrumental endodontic treatment of necrotic primary teeth, however, more high-quality clinical trials are needed in future.



### Cell Viability and Mineralization Induction by Flavonoids in Osteoblastic Cells

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**Background:** Endodontic infections can generate periapical lesions due to the imbalance between bone formation and resorption and natural substances could be interesting to stimulate bone neoformation. The aim of this study was to evaluate the effects of flavonoids EGCG, taxifolin, myricetin, quercetin, chrysin, kaempferol and pinocembrin on the viability of osteoblastic cells (SAOS-2) and the expression of mineralization markers.

**Methods:** SAOS-2 were treated with flavonoids in different concentrations (100, 50, 25, 12.5  $\mu$ M) for 24 and 48 hours and the cell viability was evaluated by the MTT method. They were also treated for 48h with changes every 2 days of culture medium until they completed 8 days to evaluate the activity of alkaline phosphatase (ALP) by the method of thymolphthalein and for 14 days to analyze the formation of mineralization nodules, by staining of alizarin.

**Results:** The results were analyzed by ANOVA/Tukey (p 0.05) and showed that quercetin at 100 $\mu$ M reduced cell viability in 24h, 50 $\mu$ M myricetin and 100 and 50 $\mu$ M chrysin were cytotoxic in 48h. The other flavonoids were not cytotoxic. Taxifolin 50 and 100 $\mu$ M and EGCG 100 $\mu$ M were the ones that most stimulated ALP activity. The formation of mineralization nodules increased with the treatment of 50 $\mu$ M taxifolin, 50 and 25 $\mu$ M myricetin and 25 $\mu$ M pinocembrin

**Conclusions:** Taxifolin was the most effective compound, demonstrating an excellent biostimulatory and mineralization-inducing effect in SAOS-2 cells, and may be a biotiv compound capable of stimulating osteoblasts and consequently bone neoformation and repair of the periapical region.

## **In Vivo Detection of External Apical Root Resorption Induced by Apical Periodontitis using Periapical Radiography and Cone-Beam Computed Tomography**

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**Background:** External apical root resorption (EARR) might be induced by endodontic pathogens in a pathologic process, consequence of a persistent stimulation of inflammatory mediators that triggers a resorptive mechanism, which gradually eliminates cementoblasts, cementum and the dentin area on the external surface of the dental root. Current technology has given access to new adjunct diagnostic tools to perform an adequate diagnosis. Though periapical radiograph (PR) remains as one of the most used diagnostic aids in dentistry, Cone Beam Computed Tomography (CBCT) are now available for the practitioner to deliver a better diagnostic and treatment plan. The purpose of this study was to investigate sensitivity, specificity, predictive values and accuracy of periapical radiograph (PR) and Cone Beam Computed Tomography (CBCT) for detection of external apical root resorption (EARR).

**Methods:** Dog's teeth with experimentally induced root resorption underwent or not root canal treatment (n = 62 roots). True positives (TP), false positives (FP), true negatives (TN) and false negatives (FN) in PR and CBCT diagnoses were determined using histopathologic findings as gold standard. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy (TP + TN) in the diagnosis of EARR were calculated. Data was compared using chi-squared test ( $\alpha= 0.05$ ).

**Results:** We found that PR detected EARR in 35% of roots and CBCT, in 47%. EARR was microscopically diagnosed in 50% (p = 0.03 comparison between PR and microscopy; p = 0.67 comparison between CBCT and microscopy). Overall, CBCT produced more accurate diagnoses than PR (0.93 for CBCT versus 0.70 for PR; p = 0.008). Interestingly, when data was stratified into small and large resorptions, PR and CBCT allowed identification of large resorption in 100% of the cases and showed the same accuracy. However, for small resorptions, PR showed an accuracy of 0.83, whereas CBCT showed an accuracy of 0.96 (p = 0.003).

**Conclusions:** We demonstrated that CBCT showed higher accuracy to detect EARR. These findings shed light on the use of CBCT for detection of initial root resorption. Early identification of resorption allows a prompt treatment and reduces the risk of dental structure loss.

**“Dark and Light Pediatric Dentistry”**

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**Background:** There is always an ongoing research in field of dental materials to improve physical and chemical properties of obturating materials. Among these, radiopacity is one of the important and prerequisite of obturating materials. An ideal root canal filling material should be radiopaque enough to allow for distinction with surrounding anatomic structures and facilitate the detection of voids. So this study is carried out to evaluate and compare the radiopacity of zinc oxide eugenol, metapex and endoflas using conventional radiographic technique.

**Methods:** Preparation of wax moulds with 1mm thickness and 7 mm internal diameter were prepared and filled with obturating materials. 3 teeth selected and obturated. An aluminum step wedge with 10 steps of 1mm was prepared and used as reference. The ISO and American National Standards Institute recommends use of  $\geq 98\%$  pure aluminum step wedge as a reference. Occlusal radiographs were taken and analyzed using histogram function in Adobe Photoshop software, version 7.0.1.

**Results:** Data analyzed showed that the mean radiopacity values of Endoflas is 172.6, of Zinc oxide eugenol is 163.7 and of Metapex is 160.7

**Conclusion:** The obturating materials used in this study met the minimum radiopacity standard recommended by the ISO and ANSI/ADA with endoflas being most radiopaque.

### **Comparing the Antibacterial Efficacy of Camellia Sinensis and Chlorhexidine Gluconate as Root Canal Irrigants in Primary Teeth Contaminated with Enterococcus faecalis: In-Vitro Study**

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**Background:** Chlorhexidine gluconate is an effective antimicrobial irrigant. However, to counter its side effects, herbal alternatives were introduced. Green tea exhibits antibacterial activity on *Enterococcus faecalis*. The aim of the present study was to compare the antimicrobial efficacy of 20% *Camellia sinensis* leaves extract versus 2% Chlorhexidine gluconate as root canal irrigants in roots of primary teeth contaminated with *Enterococcus faecalis*.

**Methods:** 50 primary roots were randomly distributed among two experimental groups, a positive control and a negative control groups:

1. 30 roots contaminated with *Enterococcus faecalis*, 15 of them irrigated with 2% Chlorhexidine gluconate and 15 with 20% Green tea leaves extract.
2. (Positive control): 15 roots contaminated with *Enterococcus faecalis* and irrigated with sterile saline.
3. (Negative control): 5 roots neither contaminated nor irrigated.

Two sterile absorbent paper points were used to absorb the irrigation fluid from each root and transferred to a test tube containing 1 ml of saline. Colony forming units of *Enterococcus faecalis* per 1 ml were counted.

**Results:** ANOVA test was significant. Positive control group had the highest (Mean±SD) followed by green tea leaves extract group. Chlorhexidine had the lowest (Mean±SD).

Pairwise comparisons showed that there was a significant difference between the means of CHX and the positive control groups, also between the means of green tea leaves extract and the positive control groups.

**Conclusion:** 20% green tea leaves extract and 2% Chlorhexidine gluconate irrigation solutions showed an antibacterial effect against *Enterococcus faecalis*. 2% Chlorhexidine gluconate showed superior efficacy against *E. faecalis*.

**A Randomized Controlled Trial Comparing the Success of Two Pulpotomy Medicaments for Primary Molars**

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**Background:** The ideal pulpotomy medicament should be biocompatible, bactericidal, promote healing, sustain vitality of the radicular pulp, support physiological root resorption, and be price efficient. The currently available materials have different advantages and limitations and the search for the ideal one is continuous. The purpose of this study was to evaluate and compare the clinical and radiographic success of a new type Mineral Trioxide Aggregate (MTA, NuSmile® NeoMTA®) and Ferric Sulfate (FS) as pulpotomy medicaments for primary molars over 12 months.

**Methods:** Fifty participants (25 per group) were enrolled, according to specified inclusion criteria. Each participant received a single primary molar pulpotomy either with MTA or FS, depending on random digit table method allocation. Fifteen pediatric dental residents completed all pulpotomies. Two calibrated examiners performed outcome assessment, according to standardized criteria. Six-monthly, the study teeth were evaluated clinically and at 12 months, radiographically.

**Results:** At six months, 42 participants (21 in each group) returned for evaluation. FS group showed 95.2 percent clinical success, compared to 100 percent for the MTA group. At twelve months, the return sample consisted of 29 participants (14 in MTA group; 15 in FS group). FS had 86.6 percent clinical and 60 percent radiographic success, while MTA showed 100 percent clinical and radiographic success. Chi-square test was used for statistical analysis. At 12-months, MTA showed statistically significantly higher success rate compared to FS ( $\chi^2=.008$ ,  $P .05$ ).

**Conclusion:** At 12 months, MTA showed superior success as a pulpotomy medicament in primary molars compared to FS.

## **Rehabilitation in Temporary Molars through the use of Preformed Metal crowns in a Patient with Severe Early Childhood Caries: Case Report**

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**Introduction:** Severe early childhood caries (S-ECC) is highly prevalent among Chilean children, causing a public health problem. There are different treatments to restore the functionality and aesthetics of tooth lost due to this, having among the options the use of composite resins and preformed metal crowns. The objective of this clinical case is to present the complex restorative treatment of a patient by the use of preformed metal crowns, achieving functional rehabilitation.

**Case report:** Informed consent was signed. Patient 4 years 3 months, Frankl scale 2, fistulas, S-ECC. Upon clinical examination due to the severe coronary destruction of the teeth, the restorative treatment was based on composite resins, glass ionomers, aesthetic anterior front and preformed metal crowns in the lower molar sector.

**Discussion:** In order to rehabilitate S-ECC lesions, multiple treatments have been described. Each of them with advantages and disadvantages. The Chilean reality makes these experiences take into account to define a treatment option in addition to the patient's individual risk.

**Conclusion:** S-ECC constitutes a Public Health problem in Chile. There are various rehabilitative treatments, but it has been seen in the literature that for the treatment of severe destruction due to extensive caries lesions, especially in molars, the Gold Standard for these situations is the use of preformed metal crowns, which have excellent results.

**Comparative Study of a Cariostatic and Fluoride Varnish in the Paralysis of Initial Caries Lesions**

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**Background:** Caries is a multifactorial disease, dependent on the presence of biofilm. Due to the possibilities of paralysis methods and initial diagnosis of caries, this study aimed to compare the efficacy of silver diamine fluoride (SDF) with fluoride varnish in first permanent molars at different stages of eruption by means of a randomized clinical trial.

**Methods:** A randomized clinical trial was conducted to select 165 children between 6 and 12 years of age who presented with carious lesions with ICDAS codes 1 and 2 on the molar occlusal surface. The sample was randomly divided into two groups: G1 (38% SDF potassium iodide-associated) and G2 (5% fluoride varnish). The lesions were classified using ICDAS and according to the stages of eruption. Re-evaluation of the indices and control of the interventions were performed after 6 months.

**Results:** G1 teeth were significantly more frequent in the 0 eruption stage compared to G2 teeth ( $P = 0.009$ ). Thus, G1 had 73 and G2 66 teeth. There was no significant difference between the groups regarding the eruption stage after the intervention ( $P = 1.000$ ). G1's teeth had a significantly higher frequency in the 0 ICDAS score when compared to G2's.

**Conclusion:** The eruption stage of the teeth was not associated with ICDAS in any of the groups analyzed after the interventions. SDF was more effective in stopping caries when compared to fluoride varnish.

**Full Pulpotomy with MTA of a Young Permanent Teeth: A Case Report**

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**Introduction:** Full pulpotomy is a treatment approach for the management of inflamed dental pulps exposed due to caries or trauma, especially for young permanent teeth. With full pulpotomy, removing the inflamed coronal pulp and covering the remaining radicular pulp with a biomaterial, promotes the healing of the radicular pulp. Due to this technique we can maintain the pulp vitality and ensure that the root development continues with the formation of hard tissue barrier on the exposed pulp surface.

**Case Report:** A 12-year old female patient with exposed pulp due to caries in left maxillary first permanent molar was treated with full pulpotomy with MTA. Clinical and radiographic examinations were performed at first, 3rd, 6th, 12th months. At the end of 12th month tooth was asymptomatic and showed no clinical and radiographic signs of infection or inflammation.

**Discussion:** Root canal treatment for teeth with exposed pulp can be considered for prophylactic purposes but it can't maintain vitality. Pulpotomy is a vital pulp therapy procedure and it is more favorable than root canal treatment. With the development of biomaterials the success rate of this treatment method has increased. But, if the procedure fails it is necessary to remove MTA and perform root canal treatment. Therefore choosing the right case is important for long term success.

**Conclusion:** Full pulpotomy with MTA showed clinical and radiographic success after one year. There were no clinical signs and symptoms of irreversible pulpitis for the treated tooth.



**Clinical and Radiological Evaluation of Amputation Therapy Applied to Permanent Molar Teeth**

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**Background:** CEM(Calcium Enriched Mixture) is a material whose clinical success has been proved with case reports in last recent years. This study aimed to compare its long term success with MTA and Ca(OH)<sub>2</sub>, which are the most used amputation materials.

**Methods:** Coronal amputation was performed on 60 permanent molar with irreversible pulpitis of 54 healthy children between the ages of 6-15 who were determined in accordance with power analysis. Zinc phosphate cement was placed on the amputation material, and as a final restoration, it was restored with composite/amalgam filling or stainless steel crowns. The successes of CEM, MTA and Ca(OH)<sub>2</sub> were compared in detail with clinical and radiographic controls performed 1,3,6,9 and 12 months. Clinically; the response to the electric pulp test, the presence of pain, ankylosis, percussion/palpation sensitivity, mobility or fistula, tooth discoloration, the state of the final restoration were evaluated. In periapical radiographs taken with parallel technique; pulp obliteration, internal/external root resorption increase/decrease in lamina dura width and root development were evaluated. Teeth meeting all criteria were considered successful.

**Results:** Of the teeth included in the study, 48 were with open and 12 with closed apex. At the 12 month check; the success rate is 84.21% in CEM Group, 78,26% in MTA Group, 66.7% in Ca(OH)<sub>2</sub> Group. The follow-up visits of the patients for 15,18, 24 and 36 months also continues.

**Conclusion:** In our study, we found CEM more successful in permanent tooth amputation, clinical and radiographic controls than existing materials.

**Surface Roughness and Microbial Adhesion after Finishing of Alkaside Restorative Material**

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**Background:** This study is aimed to evaluate and compare the surface roughness and microbial adhesion to alkaside restorative material (Cention N), resin-modified glass ionomer (RMGI), and composite resin. And to examine the correlation between bacterial adhesion and surface roughness by different finishing systems.

**Methods:** Specimens were fabricated in disk shapes and divided into four groups by finishing methods (control, carbide bur, fine grit diamond bur, and white stone bur). Surface roughness was tested by atomic force microscope and surface observation was performed by scanning electron microscope. Colony forming units were measured after incubating *Streptococcus mutans* biofilm on specimens using CDC biofilm reactor.

**Results:** Cention N surface roughness was less than 0.2  $\mu\text{m}$  after finishing procedure. Control specimens of resin and Cention N specimens were significantly ( $p = 0.01$ ) rougher. Pearson correlation coefficient ( $\text{PCC} = 0.13$ ) indicated a weak correlation between surface roughness and *S. mutans* adhesion to the specimens.

**Conclusion:** Compared with resin specimens, RMGI and Cention N showed lower microbial adhesion. Surface roughness and bacterial adhesion were not significantly different, regardless of the finishing systems.

### Use of Papacárie® in Chemical-Mechanical Treatment in Child Patients: Case Report

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**Introduction:** To reduce the inconvenience of the conventional method of removing caries, a chemical and mechanical method was created to remove the deteriorated tissue, using a blue papain, chloramine and toluidine gel called Papacárie®, which works by smoothing only the carious dentin and facilitating removal, preserving healthy dental tissue. The present work describes the technique of using Papacárie® in the chemical-mechanical treatment of pediatric patients, demonstrating its use protocol.

**Case report:** Two patients, 5 and 7 years old, presented with caries lesions. After applying the gel, we waited 40 to 60 seconds for healing the infected tissue and then the cavity was washed with water. After chemical-mechanical removal of the decay, the teeth were restored with flow resin and glass ionomer cement.

**Discussion:** Conventional caries removal therapy increases the possibility of excessive cavity preparation, wears out healthy tissue, generates dental heating, stimulates pain, exerts pulp vibration, increases the chances of exposure and is considered noisy due to the use of high exercise speed. On the other hand, the technique in which Papacárie® is used does not require anesthesia and only the manual use of blunt curettes is necessary, which favors the preservation of healthy tissues and more comfortable patient care. In the present cases, the infected tissue was easily removed and the cavities sealed satisfactorily by the operator.

**Conclusion:** This therapeutic proposal proved to be efficient for these cases, showing the importance of alternative treatments to conventional ones in the removal of caries in the context of pediatric dentistry.

## **Esthetic Masking of Developmental Defects of Enamel on Young Incisors using Resin Infiltration in Patient's Perspective**

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**Background:** Dental fluorosis occurs due to chronic fluoride exposure of ameloblasts above threshold level which leads to questionable aesthetics of teeth in smile zone. New microinvasive technique of penetrating low viscosity resin into subsurface microporosities of lesion area for their masking may be a child friendly technique. It is well accepted by both parents and patients as documented in literature. Therefore, present study was done for assessment of satisfaction of children undergoing resin infiltration technique for masking of white spot lesions in their smile zone i.e. young permanent anteriors.

**Methods:** An analysis of 60 child perspective regarding esthetic results measuring their satisfaction after using DMG ICON by 5-point Likert scale.

**Results:** Statistically significant number of patients were satisfied to 66.5% showing P value 0.001.

**Conclusion:** Resin infiltration of white spot lesions due to Fluorosis is one of the best practices for patient satisfaction in terms of esthetic masking.

**Dentin and Enamel Adhesives in Primary Teeth: Changing Scenario**

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**Background:** Improvement in technology has led to advancements in newer adhesive materials. Removal of the smear layer has increased the effectiveness of the dentin-bonding agents. The newer bonding agents include conditioning or primer components that remove the smear layer over the dentin. This results in the creation of a mechanical bond by the infiltration of monomers into a zone of demineralized dentin, where the monomers polymerize and interlock with the dentin matrix. More conservative preparations can be performed maintaining more tooth structure due to the adhesive properties of the adhesives used with composites and compomers. Meticulous care in the placement of adhesives and, subsequently, resin-based composites and compomers is necessary to produce long-term satisfactory results.

**Literature Review:** evaluating the adhesive alone without the composite remains a hard task . though technique sensitive , proper isolation , handling of material , light curing time play on the potential strength of the adhesion. From time to keep the dentin moist , to newer bonding agents advising using maximum air pressure to keep it dry , different adhesive material requisite different methods. Compomer bonding differs with composite bonding to the level of etching and conditioning of dentin and enamel and requisite alternative methods .

**Conclusion:** Tooth bonding materials should be used according to the manufacturer's instructions as they are unique to their product, and are very effective in primary teeth by enhancing the retention, minimizing any microleakage, and decreasing odd sensations.

## The Use of Stainless Steel Crown in the Context of Minimal Interventional Dentistry for Treating Hypomineralized Molars

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**Introduction:** It is known that Molar-incisor hypomineralization (MIH) is a dynamic condition with an uncertain prognosis because the opacities can turn to enamel loss over time. There is a proposal for total removal of hypomineralized enamel, but this procedure is invasive and contrary to the philosophy of minimal interventional dentistry. One treatment option for these teeth is the stainless steel crown (SSC).

**Cases reports:** A 6-years-old boy was admitted to the pediatric dentistry clinic due to dental caries. The lesions where treated, however caries was not controlled, and the patient did not return to follow ups. The patient returned after 1 year, with a complaint of pain and tooth 26 had erupted with yellow-brownish demarcated opacities with loss of structure associated with caries lesion. The second case is a 7-years-old girl with complaint of hypersensitivity in the lower first permanent molar when eating hot/cold meals and toothbrushing. Clinical examination revealed opacities on occlusal and buccal surfaces with minor enamel loss. The tooth was already restored but the pain was not solved. The stainless-steel crown was used in both cases without any tooth preparation.

**Discussion:** On the first case, the choice of using SSC was due to the high risk of caries and the difficulty in adhering to follow-up appointments (restoration fails more frequently). In the second case the SSC was used to seal the opacities by covering them to solve pain sensitivity.

**Conclusion:** SSC when applied without tooth preparation is a good alternative for the treatment of MIH affected molars.

## **An In-Vitro Comparative Evaluation of Bond Strength of Cention N and Glass Ionomer Cement to Dentin of Primary Teeth**

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**Background:** The clinical success of restorative material depends on good adhesion with the dentinal surface so as to resist various dislodging forces acting within the oral cavity. This has led to the recent advances in restorative dentistry. The aim of this in-vitro study was to compare the bond strength of Cention N and conventional GIC (Type 9) with dentin of primary teeth.

**Methods:** Sound primary exfoliating molars were collected and divided into 2 groups: Group A (Cention N) and Group B (GIC). Teeth were embedded in acrylic blocks. Class 2 cavities (slot preparation) was prepared in each specimen on the mesial and distal surfaces and were restored with either GIC or Cention N. The specimens were subjected to cyclic loads of compression and tension. The number of cycles required to break the bond were determined (fatigue strength) using the Universal testing machine.

**Results:** Cention N was able to withstand higher amount of force and showed higher cyclic fatigue strength values as compared to GIC.

**Conclusions:** Within the limitations of the study, it can be concluded that Cention N has better bond strength with dentin as compared to GIC.

### Mesiodistal and Bucco-palatine Dimensions of Stainless-Steel Crowns for Upper Primary Molars

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**Introduction:** The stainless-steel crowns are extracoronal preformed restorations for primary dentition (70% nickel); they are durable and relatively cheap, with a mayor resistance to deformation and a wide range of sizes. Nevertheless, the manufacturers don not indicate the exact dimensions of the crowns which leads to a trial and error method that can take to a longer consultation.

**Methods:** A descriptive study was carried out, in which 10 new stainless steel crowns (3M) of each size (2-7) were included, resulting on 240 crowns in total that correspond to the first and second upper molar both right and left. With previous calibration, each of the mesiodistal and bucco-palatine crowns were measured with a digital Vernier, obtaining 480 measurements. The data was analyzed with SPSS 25 (SPSS IBM, NY, EUA). Kolmogorov-Smirnov test was used to evaluate the distribution, one-way ANOVA pos hoc test to determine the differences between the crown sizes, with a statistical significance of  $p \leq 0.05$ .

**Results:** The mesiodistal and bucco-palatine crowns' lowest and highest average size numbers were: DUL2 (6.86±.04, 7.01±.04), DUL7 (8.83±.02, 9.08±.02), DUR2 (6.86±.02, 7.02±.01), DUR7 (8.82±.02, 8.99±.04), EUL2 (8.95±.02, 10.03±.02), EUL7 (10.95±.03, 12.19±.04), EUR2 (8.97±.02, 10.03 ± .02) y EUR7 (10.94±.01, 12.17±.02). The diameters proportionally increased according to the sizes by 0.2 and 0.4 mm, and statistical differences were observed on the measurements between each crowns' size.

**Conclusions:** As the size assigned by the manufacturer increased, the mesiodistal and bucco-palatine measurements increased for both the primary and secondary upper molars.



## Comparative Evaluation of Zinc Oxide Eugenol and Zinc Oxide Aloe Vera as Root Canal Filling Material in Primary Molars: A Clinical and Radiographic Study

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**Background:** Dental decay prevalence in the primary dentition remains at high levels in the infant population. Pulp treatment in deciduous teeth is challenging due to the complex anatomy of the root canal system. The limitations in biomechanical preparation and root canal cleaning can be overcome by ideal root canal filling materials.

**Methods:** A total of 100 primary mandibular molars satisfying inclusion criteria were selected from children aged 4 to 8 years who visited the outpatient department of paedodontics and preventive dentistry. They were randomly divided into 2 groups. Each group consisted of 50 teeth. Group 1 (zinc oxide eugenol) and group 2 (zinc oxide aloe vera). A standard two-visit pulpectomy procedure was performed on all teeth according to AAPD guidelines. Radiographic examination was done to confirm the quality of obturation. The procedure was completed by placing a stainless steel crown. All cases were evaluated for clinical and radiographic success at 1 week post-obturation and thereafter at 1, 3, 6 and 9 months.

**Results:** In the zinc oxide eugenol group, 29% of cases showed reduction in inter-radicular radiolucency and 8.3% of cases showed reduction in periapical radiolucency. Thus only 18.65% of total cases showed radiographic success, whereas in the zinc oxide aloe vera group, 71% of cases showed reduction in inter-radicular radiolucency and 91.7% of cases showed reduction in periapical radiolucency. Thus 81.35% of total cases showed radiographic success in the zinc oxide aloe vera group.

**Conclusions:** Both zinc oxide eugenol and zinc oxide aloe vera groups evidenced 100% clinical success at the end of the study period. However the 2 groups varied significantly in radiographic success rates.

Dental Materials, Infant Oral Health, Restorative Dentistry

## **Indirect Restoration and Conservative Approach for Molars with Molar-Incisor Hypomineralization: A Case Report**

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**Introduction:** Molar-Incisor Hypomineralization (MIH) is an enamel qualitative defect of systemic origin affecting first permanent molars and in some cases, permanent incisors. Due to the fragility, enamel can be fractured when subjected to mechanical forces. In these cases, the rehabilitation is a challenge.

**Case Report:** An 8-year-old female patient presented at the pediatric dental clinic due to caries lesions. Intraoral examination revealed the presence of MIH on all molars, with different degrees of severity. The treatment included different approaches according to the severity: minor enamel loss and caries lesions were restored with resin composite and teeth with high enamel loss were restored with conventional glass ionomer cement (GIC) using a simplified occlusal replica adapted technique. After obtaining maxillary and mandibular impressions, in the laboratory phase, a wax-up of the missing structure was performed. Then an addition silicone matrix of the wax-up was taken. In the clinical phase after acid conditioning, the matrix was filled with GIC, positioned on each tooth, and pressed for the GIC setting time.

**Discussion:** There is no evidence of the best strategy for MIH affected molars rehabilitation. The proposed technique with no tooth preparation and use of GIC is specially indicated for patients with newly erupted MIH severely affected molars, diminishing the risk of pulp exposure.

**Conclusion:** The present report showed that treatment planning might consider the characteristic of each tooth. In addition, the proposed technique may be an advantageous option for MIH affected molars, since it is able to accurately reproduce the occlusal anatomy through an agile and comfortable procedure.

**Performance of Bulk-fill Resins in Comparison with Conventional Resins in Dentistry: Literature Review**

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**Background:** Bulk fill resins are composite resins that can be applied in blocks of up to 4mm, favoring a greater speed of application and shorter clinical working time. They can be an alternative to the use of conventional composite resins, since they allow to perform restorations, optimizing the working time without altering their clinical results, helping those pediatric patients where the treatment time plays an important role.

**Literature review:** The objective is to compare the performance of bulk-fill resins with conventional resins in the area of pediatric dentistry. A literature review was performed in the electronic databases: PubMed, EBSCO, The Cochrane Library, Beic, Scopus and Tripdatabase. We included systematic and narrative reviews, clinical trials, experimental studies, cross-sectional and cohort studies with patients or young primary or permanent teeth, articles available in full text published between the years 2009-2019. The electronic search yielded a total of 120 articles. After applying selection criteria and eliminating repeats, 29 articles were relevant. After applying the inclusion and exclusion criteria, a total of 9 studies were selected. To these were added 6 articles by retrograde search, which gave a final result of 15 articles for analysis.

**Conclusions:** Bulk-fill resins have a favorable performance as well as conventional resins for restorations in pediatric patients, with the advantage of a decrease in operating time and less complexity in the technique.

### **The Storage Method is Determinant in Bond Longevity Resin/Dentin Biomineralized by Casein Phosphopeptide-Amorphous Calcium Phosphate**

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**Background:** The method used routinely for storage in vitro is the deionized water. However, the oral environment contains ions, which can affect the adhesive degradation. Simulated Body Fluid-SBF appears can more accurately simulate the oral environment. This study aimed to determine the influence of the storage method on the degradation rate of the resin/demineralized dentin-DD bonding interface, after biomineralizing treatment with casein phosphopeptide-amorphous calcium phosphate/ACP, at 24-hour and 6-month.

**Methods:** The sample consisted of 16 caries-free third molars and DD production were done by biological method. The teeth were randomly distributed into 2 groups according to the storage: G1: DD+ACP+Simulated SBF under modified simulated pulpal pressure-SBFP; G2: DD + ACP+deionized water-DW. The dentin was submitted to bonding with Adper™ Single Bond 2 and a block of Filtek™ Z350 resin composite/ $\cong$ 4mm/height was built over it. The resin/dentin sets were stored in SBFP or DW at 37°C. After 24-hour and 6-month, microtensile bond strength- $\mu$ TBS were performed. The failure mode was analyzed by Scanning Electron Microscopy. Data from  $\mu$ TBS were submitted to two-way ANOVA and Tukey tests, and from failure patterns to Kruskal-Wallis test ( $\alpha=5\%$ ).

**Results:** The highest  $\mu$ TBS values were found for DW at 24-hour storage. There was reduction of the  $\mu$ TBS the both groups at 6-month, however, SBFP showed a higher  $\mu$ TBS values than DW storage after 6-month storage ( $p<0.05$ ). There was no significant difference between failure mode over time ( $p<0.05$ ), with predominance of mixed fractures.

**Conclusions:** The SBFP storage method decreased the degradation rate of the biomineralized resin/dentin union interface with ACP.

**Effect of Toothpaste Containing CPP-ACP and Fluoride in the Prevention of Enamel Demineralization**

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**Background:** To evaluate the effect of fluoride- and CPP-ACP containing toothpaste on their ability to prevent enamel demineralization.

**Methods:** Freshly extracted human permanent molar teeth were obtained from the Department of Oral and Maxillofacial Surgery, Dental School, MU, Indore after prior permission from the institute. Enamel human specimens were assigned to the following groups: G1- (MI Paste ONE, 1100ppm F and 10% CPP-ACP (Casein PhosphoPeptide-Amorphous Calcium Phosphate), GC America Inc, USA); G2- 1450 ppm NaF toothpaste (Colgate Total) and G3-Control (deionized water). Enamel block of 3 x 3 x 2 mm was prepared from a flatter labial surface and embedded in epoxy resin. Superficial surface of enamel was ground flat with water-cooled carborundum discs and 1200 grit Waterproof Silicon Carbide Paper thereby removing about 200 µm of enamel. To produce demineralised lesions the samples are stored in acidic hydroxyethylcellulose (HEC, pH 4.8) for 3 days. One part of toothpaste and 3 parts of artificial saliva (9 g:27 ml) using a laboratory stand mixer until homogeneous. After the mixture is prepared, different toothpastes are exposed to each group's enamel surface by an applicator brush and left undisturbed for 2 minutes. A digital Micro Vickers Hardness Tester (Wilson Wolpert Europe BV, 401 MVD, Netherland) fitted with a Vickers diamond and a 200N load is used to make indentations in the enamel surface. Data is analysed using SPSS 20.0 software. ANOVA is used for surface microhardness recovery (%SMHR) among treatments. Repeated measures analysis of variance is used to assess statistical differences. The significant level (p) was set at 0.05

**Results:** The mean baseline surface microhardness value was similar for all treatment groups before demineralization (p =0.378). The mean SMHR % was found to be higher in the teeth treated with CPP-ACP + 1100 ppm Fluoride toothpaste ( $27.48 \pm 10.34$ ) than in the teeth treated with 1450 ppm NaF ( $22.89 \pm 13.18$ ) and this difference was statistically significant (p=0.000).

**Conclusions:** The CPP-ACP and 1100 ppm F containing toothpaste demonstrated having the most protective effect against demineralization.

## Surface Roughness Evaluation of Restorative Materials Submitted to Erosive Challenges

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**Background:** Most soft drinks have a very low pH and consumption is increased among children. The aim was to assess the erosion potential of the most commonly consumed soft drinks and to determine its impact on the surface roughness of restorative materials.

**Methods:** The materials used in this study are: nanohybrid composites (Filtek Ultimate and Tetric EvoCeram), giomer (Beautiful Flow Plus) and glass ionomer (Fuji Triage). Coca-Cola (pH=2.4), iced tea (pH=3.5) and multivitamin soda (pH=3.4) were used as acidic beverages. Artificial saliva and distilled water served as control groups. A total of 100 samples were made-25 from each material, divided into 5 groups and immersed in 5 solutions. Total of 1500 measurements were conducted by the profilometer. Surface roughness parameters (Ra) were analyzed at baseline, after 7 and 14 days of exposure to low pH.

**Results:** Fuji Triage showed a slight decrease in roughness in Coca-Cola, which was not statistically significant ( $p > 0.05$ ), while a statistically significant increase ( $p < 0.05$ ) was observed in ice tea and multivitamin soda. Citric acid, from iced tea and multivitamin soda, appear to be more erosive to materials containing metal cations (glass ionomer, giomer), while phosphoric acid, from Coca-Cola, degrades surface with extremely low pH, resulting in increased surface roughness within the nanohybrid composites ( $p < 0.05$ ).

**Conclusion:** Restorative materials showed a different response to low pH related to acidic ingredients in soft drinks. The importance of knowing patients' dietary habits is relevant in choosing the appropriate restorative material.

## Current Splinting Techniques for the Traumatized Tooth: A Review

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**Background:** Traumatic dental injuries are a common presentation in the paediatric dental patient and injuries where displacement has occurred, for example luxation and avulsions as well as displaced root fractures will require stabilization once repositioned. Although splinting is rarely justified in the primary dentition it may be utilized in individual cases. The range of splinting techniques are available to the paediatric dentist and consideration of these is necessary to inform treatment options.

**Literature Review:** Splinting choices include rigid and flexible options. Rigid splinting with arch bars, wire ligatures or heavy orthodontic wire has been shown to promote pulp necrosis and periodontal ligament (PDL) damage with resulting ankylosis and replacement resorption. Therefore, non-rigid, physiological splinting is accepted as the gold standard. Wire and composite splints are cost-effective and widely available to the general practitioner. Care must be taken to use a flexible wire (no larger than 0.4mm). Similarly, orthodontic brackets and wire may be beneficial. Fibre splints cemented with composite resin have also shown favourable outcomes. The titanium trauma splint (TTS) is a 0.2mm thick, flexible splint, which is easily adapted to the arch contour. It has a rhomboid structure, allowing cementation using flowable composite. The TTS has been compared favourably with alternative flexible splints in the literature and has the benefit of reduced chairside time. Its disadvantage however is increased cost. Composite splints are rigid and prone to fracture and are not to be recommended.

**Conclusions:** Physiological splinting is essential to reduce PDL injury and therefore improve long term outcomes in the growing patient.

**Retinal Damage Related to Chronic High Intensity Led Exposure: An In Vivo Study**

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**Background:** The dental lights curing units are vital to the practice of dentistry. About half the time of restorative procedure is spent using the light, although dentists are not giving enough attention to use appropriate eye protection. Therefore, this study rated the chronic effects of a high intensity LED light from a curing device on the retinas of Wistar rats.

**Methods:** The left eyes of the six male Wistar rats were exposed to LED in high potency, 3.200mW/cm<sup>2</sup> (Valo Ortho - Ultradent), for 144 seconds at a distance of 30cm, three times a day, for 7 days, to investigate if any changes in the retina has occurred. During the photostimulation, the right eyes were covered with removable plastic opaque tampon, composing the control sample. After which the eyes were resected and processed histologically. These slides were analyzed stereologically and histomorphometrically to measure the parameters of the retina under investigation.

**Results:** No statistically significant intergroup differences were found for total retinal volume or for the volume of each layer of the retina alone. The histomorphometric analysis presented statistically significant reduction for the cellular areas, with a reduction of 25,32% for the internal nuclear layer, 17,59% for external nuclear layer and 16,76% for ganglionic layer. Although the numerical density of the internal and external nuclear layers decreased, and the ganglion layer increased, they showed no statistically significant difference.

**Conclusion:** Chronic exposure of the high-power LED induced cellular atrophy in the internal nuclear layer, external nuclear layer and ganglionic layer.



## Effect of Different Etching Modes of a Universal Adhesive on the Nanoleakage of Class II Compomer Restorations

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**Background:** The aim of this study was to evaluate the sealing ability of a universal adhesive used with different etching modes after 1- and 3-year artificial aging in Class II compomer restorations of primary molar teeth.

**Methods:** 63 extracted mandibular primary second molars were used in the study. Standardized Class II box cavities (3x3x1,5 mm) were prepared in each tooth. Then, teeth were divided into three groups (n=21) according to the etching protocols: total-etch, self-etch and selective-etch, and adhesive (Prime&Bond Elect Universal, Dentsply, Milford, USA) was applied. All teeth were restored with compomer (Dyract Extra, Dentsply, Konstanz, Germany) and divided into three subgroups (n=7) according to the aging protocols: 24h water storage, 1-year aging and 3-year aging with the chewing simulator (Esetron Chewing Simulator, Ankara, Turkey). After the aging protocols, a 50% silver nitrate solution and dental X-Ray developer were used as tracers. The nanoleakage analysis was performed using a micro-computed tomography system (Skyscan 1275, Kontich, Belgium) and the volume of the silver nitrate penetration was calculated in mm<sup>3</sup>. Data was analyzed using Kruskal-Wallis H and Friedman tests.

**Results:** 1-year aging significantly increased the leakage of self-etch groups (0.197±0,49 mm<sup>3</sup>) compared with the total- (0.001±0.00) and selective-etch (0.001±0.00) groups (p0.05). There was no difference between the groups at baseline and after 3-year artificial aging (p0.05).

**Conclusion:** Self-etch etching mode of the universal adhesive showed higher nanoleakage levels at all examination intervals, however the difference was only significant after 1-year aging. Universal adhesives can be used with all etching modes in compomer restorations.

Dental Anomalies, Dental Materials, Restorative Dentistry

## **The Aesthetic Restoration of Missing Anterior Teeth and Maxillary Polydiastema with Composite Mock-Up Technique and Fiber Bridge**

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**Introduction:** Mock-up technique and fiber bridge are frequently used techniques in the last years in order to fulfill patients' aesthetic needs. Mock-up technique is a bio aesthetic approach for the excessive material loss in the teeth, missing of the teeth, and congenital aesthetic defects and it is used for both diagnosis and aesthetic treatment. Fiber bridges are successfully applied especially for the missing single tooth. In that case report, it is aimed to present the aesthetic treatment using mock-up technique and fiber bridge in a child patient having missing anterior teeth and maxillary polydiastema not treated by orthodontic treatment before.

**Case report:** The oral examination of a 14 year-old male patient consulted at Atatürk University Faculty of Dentistry Department of Pediatric Dentistry for aesthetic reasons was performed. The orthodontic treatment of the patient who has polydiastema and missing single tooth had been completed before. A model was produced after getting measurements from the patient. The silicon key produced from the model was used as a guide and the diastemas were closed by composite resin. After that, the fiber bridge was positioned for the missing tooth.

**Discussion:** Diastemas and tooth deficiencies in the anterior region can lead to aesthetic problems. Direct composite restorations and fiber bridges have long been used in the treatment of aesthetic problems, giving aesthetic and clinically acceptable results.

**Conclusion:** Direct composite restorations and fiber bridges can be preferred in patients with diastema and tooth deficiency due to their easy application and ability to meet aesthetic and economic requirements.

**MTA Cvek Pulpotomy: Case Report and Literature Review**

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**Introduction:** The Cvek pulpotomy is a technique used in complicated crown fractures in permanent teeth. It includes the removal of 1-3 mm of the coronal pulp located around the pulp exposure. The purpose of the report is to present a case of a complicated crown fracture in a young permanent central incisor and its conservative management that safeguards the development of the tooth and improves the quality of life of the patient.

**Case report:** A 12-year-old patient attended the Pediatric Dentistry Postgraduate Department at the “UPCH” indicating sensitivity after dental trauma. The oral exam revealed a significant crown fracture of the upper right central incisor with pulp exposure. A Cvek pulpotomy was performed on incisor 11. The bleeding was easily controlled at the entrance of the radicular pulp with a cotton pellet and a layer of MTA Angelus® was placed. The tooth was immediately reconstructed with a composite resin. Clinical and radiographic controls at 1, 2, 10 and 16 months showed good healing through a non-pathologic process, and no evidence of apical or periodontal infection.

**Discussion:** Complicated crown fractures can easily evolve into pulp necrosis, causing an alteration in the root development. The Cvek pulpotomy with MTA helps the development of a dentinal bridge and allows an apical closure and the thickening of the dentine walls in order to prevent a future root fracture.

**Conclusion:** In this case, a partial pulpotomy with MTA showed clinical and radiographic success after 16 months, proving to be an excellent conservative alternative for the treatment of complicated crown fractures in young permanent teeth.

**Indirect Restoration in Pediatric Patient with CTI-S: Case Report**

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**Introduction:** The treatment of patients with severe early childhood caries (S-ECC) consists of oral hygiene strategies, diet control and remineralization of the affected tissue. Because they are small patients, they require fast and effective treatments to limit the damage. The use of glass- ionomer cements in Minimally Invasive Dentistry lies in its biocompatibility, fluoride release, adhesion to the tooth structure and low solubility, among others. However, in incisal areas its use is questioned.

**Case report:** 2.1-year-old female patient, in good health, Frankl 2, with cavitated and active caries on the incisal edge of upper maxillary incisors, caused by breast feeding. It was treated by giving oral hygiene instructions (This improves the bond between mother and daughter.) and modifying the diet by avoiding the intake of simple carbohydrates. Restoration of the incisors were carried out by placing indirect restorations made of photocurable resins and cemented with glass ionomer. The restorations were still present at the one-year follow-up appointment, fulfilling their function.

**Discussion:** The technique allowed to reduce the time in the dental chair, as well as to avoid the production of aerosols, in these times of the COVID-19 pandemic. As they were cemented with IOV, the lesions were deactivated by releasing fluoride and allowing less tissue removal.

**Conclusion:** Indirect restorations are an option for the rehabilitation of anterior teeth with severe caries in patients under 3 years of age.

### **Role of 3D Printing in Pediatric Dentistry**

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**Background:** Science and technology have revolutionized the fate of mankind in numerous ways. Collaborating the knowledge in science and engineering with medicine has opened new doors for innovative health care. Varied individual anatomy in children, complex architecture, lack of precision on conventional imaging and inherent human errors can often compromise the quality of child health care. 3D printing is the ideal solution that addresses individualization in health care.

**Literature review:** P. Vasamsetty et al., (2020) stated that, 3D printing allows us to visualize the precise anatomy, fabricate patient specific models, surgical guides, stents, prosthesis, drug delivery devices etc. Conventional manufacturing has struggled to create complex and precise anatomic replicas that 3D printers are now producing with minimum effort. Newer composites and hybrid plastics make it possible to fabricate prosthesis that are lighter in weight, thus making it comfortable for the child, but also offer greater strength. 3D printing in dentistry allows working on the pediatric patient as much at the convenience for the pediatric dentist as well as the patients.

**Conclusion:** The use of 3D technology presents innovative digital designs which are precise, quick, and easy to implement. Development and perfection of 3D printing technology allows production of information in 3D's with accuracy. There is huge potential in the application of 3D printing for pediatric dentistry, yet to be explored.

### Photobiomodulation Therapy in Paediatric Dentistry

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**Background:** PBM (photobiomodulation) therapy has been noted to alleviate pain and inflammation while promoting tissue healing and regeneration. These basic processes contribute to the fundamental etiopathogenesis of various oral diseases, and hence, there is now a growing list of potential clinical applications with PBM therapy in children.

**Literature review:** Among the remarkably broad biological responses noted with PBM therapy, its effects on mitigating pain, inflammation, and aberrant immune responses as well as promoting tissue healing and regeneration have been well documented. Fornaini et al. outlined several PBM treatment applications in pediatric dentistry such as prevention and/or treatment of oral mucositis associated with oncotherapy, postsurgical oral pain, and pulpotomies. They particularly note a lack of any adverse events being reported in all these studies.

**Conclusion:** PBM therapy is a safe and effective treatment modality for various clinical applications in pediatric dentistry. The broad ranging clinical benefits of PBM therapy from multiple fields of clinical dentistry emphasize the immense therapeutic potential of PBM therapy.

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**Evaluation of Antimicrobial Activity of Glass Ionomer Cement Incorporated with Cashew Nut Shell Liquid**

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**Background:** Dental caries remains a significant oral health problem in children all over the world. Atraumatic restorative treatment (ART) has been used in pediatric restorative dentistry to control the caries. However, hand excavation instruments do not remove carious dentin as effectively as rotary burs, and cariogenic bacteria can remain under glass ionomer cement (GIC). Therefore, antibacterial agents have been used to improve the antibacterial properties of the GIC. The aim of the study was to evaluate (i) the inhibitory and bactericidal activity of cashew nut shell liquid (CNSL) against oral bacteria; and (ii) the antibiofilm potential of conventional glass ionomer cement incorporated with CNSL.

**Methods:** The antibacterial effect of CNSL against *S. mutans*, *S. mitis*, *S. sobrinus*, *S. sanguinis*, *S. salivarius* and *L. casei* was assessed by determining the minimum inhibitory (MIC) and minimum bactericidal (MBC) concentrations. The antibiofilm effect of the glass ionomer cement incorporated with the substance against a mixed-species biofilm of *Streptococcus mutans* and *Candida albicans* was determined by direct contact test. The values were submitted to statistical analysis by one-way ANOVA and Tukey's test ( $p < 0.05$ ).

**Results:** CNSL showed antibacterial activity for all strains tested, with MIC and MBC values ranging from 3.12 to 25  $\mu\text{g/ml}$ . Furthermore, CNSL-doped glass ionomer showed antibiofilm effect once there was no growth of colony forming unit counting (0.00 CFU/ml).

**Conclusion:** CNSL-doped glass ionomer cement has the potential to be used as antibacterial restorative material.

**Comparative Evaluation of Mechanical Properties after Application of G-Coat Plus, Newly Formulated Nano Silver Fluoride(NSF) Resin Coat and Vaseline over Glass Ionomer Cement Restoration**

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**Background:** In contemporary dentistry, glass ionomer cement (GIC) has gained popularity in paediatric dentistry. For overcoming the trouble of moisture sensitivity, various coatings like petroleum jelly, varnishes or bonding resins are applied over GIC to avoid contamination. G-Coat Plus (GC) was recently launched to serve this purpose. Nevertheless, the problems of microleakage, low strength and fluoride release still persist. Hence, this present study was performed to evaluate effect of newly formulated resin protective coating on microhardness and microleakage of commercially available GIC, Fuji II, under in vitro conditions.

**Methods:** 150 orthodontically extracted, non-cariou premolars were selected. A standardized Class V cavity was prepared on buccal surface of each tooth for assessment of microleakage, and microhardness. To assess both the parameters the samples were divided into 3 groups, Group1-Vaseline, Group2-G coat plus, Group3-NanoSilverFluoride resin coat. Protective surface coatings were applied and samples were placed in artificial saliva. Thermocycling was carried out at 5°C and 25°C for 300 cycles. Surface microhardness was tested by Vickers microhardness testing machine under a load of 50grams for 10seconds. For microleakage testing, samples were immersed in 1% methylene blue for 24 hours, sectioned and evaluated under stereomicroscope for dye penetration.

**Results:** There was a statistically significant difference in NanoSilverFluoride resin coat and G coat plus group in terms of both microhardness and microleakage. Vaseline group showed poor results in both the assessment.

**Conclusions:** Samples protected using NanoSilverFluoride resin coat demonstrated better mechanical properties than the other products as well as having better fluoride release and antibacterial properties.



**Envisioning the Future of Restorative Materials**

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**Background:** Dental caries is a highly prevalent and costly disease in the world, representing the most common infectious disease in the paediatric population. Restoration of decayed primary teeth is important so as to maintain the health of the primary teeth for proper chewing and eating, providing space for the permanent teeth and guiding them into the correct position and permitting normal development of the jaw bones and muscles.

**Literature review:** Many direct filling materials are available in modern day dental practice. Amalgam was first introduced to western dentistry in the 19th century while the glass ionomer cements were introduced around the 1970s. Composite became standard restorative material in 1980s while resin modified glass ionomers and compomers came into practice in 1990s and the current decade saw the launch of several bulk-fill composites. Multicolored restorative material like Fuji VII and MagicFill are manufactured in various bright colors with glitter inclusions to attract the children. It is polymerized both by light cure and chemical resin cure with high physical strength. Recently, bioactive dental materials are introduced which stimulates the formation of apatite and chemically bonds to teeth sealing the cavity. ACTIVA bioactive is the only esthetic bioactive restorative material.

**Conclusions:** Thus, oral health professionals need to make wise decisions about the type of restorative material to be used to best manage the patients with childhood caries.

**Chair Side Space Maintainer: Case Series**

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**Introduction:** Though preventive, restorative and pediatric endodontics has come long way in pediatric dentistry but still sometimes we have to decide to prematurely extract a tooth and maintain the space until the permanent teeth erupt. . Space management concepts in paediatric dentistry has hardly undergone any changes and customised space maintainers are still choice of treatment with only the only disadvantage of multiple appointments.

**Case Report:** In this case series total 21 band and loop space maintainers were placed with 11 customised and 10 chair side space maintainer in 9 children aged between 3 to 7 years old. The preformed band selection was done as per tooth size. These bands were spot welded with part B of loop. The loop (Part A) with various sizes were selected, adjusted and crimped. The various factors such as gingival health, de-cementation, breakage of appliance and parents satisfaction were assessed with three, six and 12 month follow up. Out of 10 chair side space maintainer one space maintainer got de-cemented and two chair side space maintainer got de-cemented. Out of 10 chair side space maintainers 3 obstructing erupting premolar and has to be removed immediately.

**Discussion:** The advantage of chair side space maintainer as it can be delivered in same appointment so less time consuming and accepted well by parents. Another advantage is there is no need of impression, band transfer and soldering process. There are certain shortcomings such as loop is not following gingival contour and most important width of loop is very much less as compared to buccolingual width of premolar so regular follow up is necessary. There was no significant difference between gingival health and de-cementation with both types of space maintainer.

**Conclusion:** The chair side space maintainer are less time consuming and more beneficial to the patient and clinician. The same appointment, lack of soldering process are certain advantage. The loop width, necessity of frequent follow with chair side space maintainer are disadvantages . The long term follow-up with large sample size is necessary.

Cariology and Preventive Dentistry, Dental Materials

### **The Effect of Vital Pulp Therapy Using TheraCal LC versus MTA-Angelus on Survival Rate of Cariously-Exposed Vital Young Permanent Molars: A Randomized Clinical Trial**

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**Background:** Carious pulp exposure of immature permanent first molars in children is a widespread unfortunate event. Choice of pulp capping materials could have a massive influence on the success of vital pulp therapy. Aim of the current study was to compare pulpotomy of cariously-exposed vital young permanent molars using TheraCal-LC versus MTA-Angelus regarding tooth survival rate, chairside time and radiographic success.

**Methods:** This was a double blind randomized clinical trial.. Twenty-two permanent molars were treated, 7.7 years was the mean age of participants. Steps of the procedure included nerve block administration, rubber dam isolation, pulpotomy, direct application of capping material, placement of glass ionomer base and composite resin final restoration. Only 20 teeth finished follow-up for five years. Pre-calibrated blinded dentists assessed clinical and radiographic results separately with an excellent strength of agreement (Kappa =0.85).

**Results:** Using absolute risk reduction following results were obtained: Clinically, the risk of spontaneous pain and swelling was 7-times, and 5-times, more in TheraCal group, respectively. Radiographically, the risk of periapical radiolucency and root resorption occurrence was 9-times, and 2-times more in TheraCal group, respectively. The probability of root maturation was 20% less in TheraCal group. The overall clinical and radiographic success rate for MTA was 90.9%. The overall clinical and radiographic success rate for TheraCal was 18%. Results were statistically significant.

**Conclusion:** MTA is excellent for pulpotomy in young permanent molars. TheraCal LC is not suitable for pulpotomy in young permanent molars.

**An In-Vitro Evaluation of Mechanical Properties of a New Dual Cure, Universal, Bioactive Luting Cement**

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**Background:** Luting cements used for the cementation of stainless steel crowns are important for the retention of restorations, as well as maintaining the marginal integrity, thus extending the form and function of the overall restoration in the oral environment. The shear bond strength of a material determines its risk of adhesive failure between the material and another substrate. The tensile strength of a material determines its risk of cohesive failure within itself. However, as luting cements are low-strength materials, determination of tensile strength poses a significant challenge. One possible way of assessing the tensile strength is by evaluating its flexural strength; as the flexural strength of low-strength materials has shown a positive correlation with their tensile strength.

**Methods:** 20 healthy primary molar teeth, extracted due to pre-shedding mobility, were embedded in acrylic blocks and their exposed surfaces were prepared and bonded with cylinders of the two materials for testing shear bond strength. For assessing flexural strength ten samples of each material were prepared, using a pre-fabricated mould. All parameters were tested using a Universal Testing Machine, and the values obtained on the computer readout were interpreted and analysed

**Results:** The shear bond strength of the GIC was significantly higher than that of the BioCem® group ( $p < 0.001$ ). GIC showed higher bond strength (Mean: 9.46MPa) than BioCem® (Mean: 4.60MPa). Moreover, the flexural strength of the BioCem® was significantly higher than that of the GIC group ( $p < 0.001$ ). BioCem® showed higher bond strength (Mean: 18.84MPa) than GIC (Mean: 9.87MPa).

**Conclusion:** BioCem® may be used for the cementation of stainless steel crowns to primary teeth, but further studies would be required before advising it as a replacement for glass ionomer cements, in a clinical setup.

**Twenty years of MTA: The Past, Present and Future in Pediatric Dentistry**

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**Background:** Mineral Trioxide Aggregate (MTA) received FDA approval for use in dentistry in 1998. Since then, it has been used for many clinical applications like apexification, apexogenesis, retrograde root end filling, lateral and furcal perforation repair, direct and indirect pulp capping and root canal sealing. Starting from its primitive forms, similar to Portland cement, the material has come a long way in terms of its properties and physical forms. The aim of this literature review is to review the range of clinical applications and changes in physical properties that the material has gone through in these years.

**Literature review:** A review was done using hand and electronic search of published papers for chemical and physical properties and forms of MTA from year 2000-2020.

**Conclusions:** Excellent biocompatibility and power of tissue regeneration are two properties which have superseded the potential drawbacks like staining, handling and cost of the material. The newer forms of the material have the potential to offer more promising outcomes. The presentation highlights the key milestones in the evolution of MTA as a dental material in paediatric dentistry.

# ***Dental Trauma***

## Dental Trauma

**Management of Mandible Alveolar Process Fracture and Lip Laceration In Pediatric Patient: A Case Report**

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**Introduction:** Trauma is one the leading causes of morbidity and mortality in the pediatric population worldwide. The prevalence of pediatric trauma is related to a lower perception for the hazards that surround the children, combined with the safeless nature that is typical for children. Pediatric patients bone repairing capabilities possesses physical properties that coupled with space occupying developing dentition give rise to patterns of fracture not seen in adults.

**Case report:** A 5-year-old boy reported to the ER in Hospital Angeles Lindavista with bleeding from oral cavity and mandibular lip following fall from “Little Tikes Coupe Car”, 1 hour and 15 minutes after the accident. Clinical examination revealed a bruise chin and lacerated mandibular lip. Intraoral examination showed profuse bleeding and occlusion disturbance, lateral luxation to palatal region of upper central right and left incisors, fracture of mandibular dentoalveolar process in the incisors region toward to the lingual region. Treatment to dentoalveolar fractures consisted in reposition of displaced segments and then splinted, as well as lip suturing after fixing the fracture.

**Discussion:** Numerous reports on pediatric facial trauma patients have been published, in pediatric patients. The severity of sequel to permanent successors depends to: age of the patient, type and extension of the injury and developmental stage of the successor.

**Conclusion:** Based on the information presented in this case, it can be concluded that the follow up of the IADT guidelines combined with a good management of soft tissues and patient/parents cooperation could be successful in the treatment of pediatric injuries.

**Mediators Involved in Tooth Resorption following Delayed Replantation: An Experimental Study**

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**Background:** Although inflammatory and replacement tooth resorption are common following tooth replantation, biological mediators involved in these processes are widely unknown. Therefore, the aim of this study was to investigate molecules involved in tooth resorption following permanent tooth avulsion and delayed replantation.

**Methods:** Healthy dog premolars were extracted and kept dry for 20, 60 and 90 minutes (n= 30). Next, teeth were replanted, splinted with steel wire and composite resin and root canals filled with AH Plus sealer. After 120 days, animals were euthanized and tissues removed for histological processing. Slides were stained for microscopic analysis, submitted to tartrate resistant acid phosphatase (TRAP) histoenzymology and immunostained for RANK, RANKL, osteoprotegerin (OPG), alkaline phosphatase and periostin. Data obtained were submitted to statistical analysis using the chi-square, Fisher and one-way ANOVA tests (alpha= 0.05).

**Results:** The longer the extra-alveolar time, the greater the frequency of inflammatory and replacement resorption. In inflammatory resorption areas, TRAP + and RANK + osteoclasts surrounding the replanted teeth were identified, regardless of the extra-alveolar time. RANKL synthesis in this region was higher in longer extra-alveolar time (p 0.05) and was more intense after keeping the tooth dry for 90 minutes compared to other periods (p 0.05). In the replacement reabsorption area, there was lower synthesis of periostin and higher alkaline phosphatase production (p 0.05).

**Conclusions:** Delayed replantation resulted in tooth resorption. Inflammatory resorption was characterized by osteoclast recruitment and RANKL synthesis and replacement resorption was characterized by inhibition of periostin and higher alkaline phosphatase syntheses.



## Impact of Avulsion of Primary Incisors on the Occurrence of Sequelae in the Permanent Dentition: A Cohort Study

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**Background:** Avulsion in the primary dentition may cause sequelae in the permanent dentition and thus lead to long term consequences for the child. The purpose of the study was therefore to investigate the occurrence of sequelae in permanent teeth after avulsion of their primary antecessors and to evaluate the factors associated with the sequelae.

**Methods:** Records from 194 patients with avulsion in the primary dentition (uni or multi-trauma) followed at the Centre of Dental Trauma in Primary Teeth, University of São Paulo, 1998-2019, were evaluated. Multilevel Poisson regression analyses were conducted between the explanatory variables related to children and avulsion; the outcome variables were occurrence of sequelae in permanent teeth, of opacities, hypoplasia and malformation.

**Results:** From 266 avulsed teeth included, 115 (43.2%) permanent teeth suffered sequelae. Children aged 3-4 years old and 4 years on avulsion had lower risk for suffering sequelae (RR= 0.39; 95%CI= 0.19 to 0.75, and RR= 0.65; 95%CI= 0.44 to 0.96) than children aged 0-2. Additionally, when  $\geq 3$  teeth suffered avulsion, occurrence of sequelae in permanent teeth was more probable (RR= 1.72; 95%CI= 1.0 to 2.8), compared to avulsion of a single tooth. Belonging to age groups  $\leq 4$  years of age were protecting factor for occurrence of hypoplasia, as well as age group 4 for occurrence of opacities.

**Conclusions:** The occurrence of sequelae in permanent teeth after avulsion of their antecessor is higher when the trauma occurs in younger children and it is more frequent in avulsions of greater magnitude, when more teeth are affected.

### **Sports Mouthguards in Children: Bacterial Contamination Pattern, Surface Roughness and Chlorhexidine Spray used as a Disinfection Method**

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**Background:** An active lifestyle has become essential in people's daily lives, regardless of age, and playing sports is a part of this general health pattern. However, these activities can be considered a risk factor for the occurrence of traumatic injuries, thus, the use of sports mouthguards has been recommended preventively. The correct hygiene of these devices are necessary to offer longevity of mouthguards. The aim of this study was to evaluate, microbial contamination of sports mouthguards, surface roughness, and the efficacy of chlorhexidine gluconate spray in the disinfection protocol.

**Methods:** Twenty children who practiced martial arts, were instructed to wear sports mouthguards 3 days a week and after use, spray sterile tap water (control group) or 0.12% chlorhexidine (experimental group). After 2 weeks, the devices were analyzed by MTT assay, Checkerboard DNA-DNA hybridization, and confocal laser microscopy.

**Results:** Mouthguards of the control group were more contaminated with cariogenic microorganisms than those of the chlorhexidine group ( $p = 0.005$ ). Decreased bacterial cell viability was observed in the chlorhexidine group, thus emphasizing its cytotoxic effect on microorganisms ( $p = 0.0007$ ). A difference in the surface roughness of the protectors was detected, as demonstrated by the increase in the final roughness when compared to the initial roughness. A moderate correlation ( $r = 0.59$ ) was observed between surface roughness and the number of cariogenic microorganisms in the control group.

**Conclusion:** Sports mouthguards had intense bacterial contamination and increased surface roughness after its use, and 0.12% chlorhexidine spray was effective in reducing this contamination.

## **A Case Report of Conservative Management of Luxation Injury in Primary Dentition Using Splinting Technique**

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**Introduction:** Luxation injury is a common type of traumatic dental injury in primary dentition due to the resilient alveolar bone. Treatment varies depending on the type and extent of injury. One such treatment option is splinting of teeth. Flexible or semi-rigid splint allows pulp and periodontal healing and maintain the tooth in the arch.

**Case report:** A 4-year old male child patient visited our department two hours after road traffic accident with laceration in the forehead and right upper lip. Mouth opening was adequate and crown of 51 was displaced palatally. Crown of 81 had fractured exposing the pulp. Orthopantomogram was done. 51 was repositioned immediately with gentle digital manipulation under local anesthesia followed by composite-wire splinting. Soft tissue lacerations were sutured. Pulpectomy was done in 81. Patient was discharged with analgesics and antibiotics and oral hygiene instructions. Healing was uneventful after two weeks and splint was removed.

**Discussion:** Luxation injuries are more common in primary dentition than fractures. Splinting using wire and composite is advantageous as it decreases the mobility and pain and allows for physiologic mobility and easy cleansing. However, repositioning of the primary tooth should be done with caution since there is a probability of damaging the permanent tooth bud. Proper treatment planning followed by good oral hygiene preserves tooth until natural exfoliation.

**Conclusion:** The present case report showed successful conservative management of lateral luxation using the splinting technique. Careful diagnosis and treatment planning with timely follow-ups proved successful in our case.

**Revascularisation Revisited-Natural, Faster Root Formation**

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**Introduction:** Endodontic treatment in an immature permanent tooth which is either traumatized or cariously exposed is difficult to perform. The root canals of these teeth are open as well as fragile for instrumentation and obturation. The age-old treatment of apexification, consisting of insertion of calcium hydroxide paste into the root canal for a predetermined time but newer methods are evolving.

**Case Report:** An eight-years-old female child reported with a trauma to upper lateral incisor of left side with an abscess. The trauma occurred 1 year back. The patient had visited a local dentist initially but no treatment was meted out. The patient visited us after a year with abscess. The intra-oral radiograph showed the presence of open apex for the affected tooth. Revascularization has emerged as an alternative over calcium hydroxide apexification, with a varied range of treatment protocols which can be found in the scientific literature. Revascularisation was attempted in this tooth after consent from parents using triple antibiotic paste (cefaclor, ciprofloxacin, metronidazole), with copious irrigation with 3% NaOCl and 17% EDTA. This was done in two visits and proper closure of access cavity. The closure of apex was seen in 9 months.

**Discussion:** The main advantages of revascularization technique over the traditional apexification or artificial barrier technique in endodontic treatment of immature necrotic teeth include continuation of root development and strengthening the root structure.

**Conclusion:** The favorable results in this case show that regenerative endodontic treatment of pulpally involved traumatized necrotic immature tooth is a viable alternative to apexification or artificial apical barrier techniques, for permanent teeth.

**Reattachment of a Fractured Anterior Tooth- A Five year Follow up**

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**Introduction:** One of the most common cases seen in children in any clinical practice is Tooth trauma. So, it's important for every dental professional to be prepared to assess and treat such cases when necessary. Reattachment of a fragment to the fractured tooth can provide a good and long lasting esthetics to the patient. This case report highlights the treatment performed on a 8 year old boy with dental trauma by means of fracture reattachment

**Case Report:** A Parent of a 8 year old boy informed that his child fell on the play ground and both his maxillary central incisors had fractured. Upon hearing this we instructed the parent to store the tooth in milk and report to the clinic the next day. After clinical examination he was diagnosed with an uncomplicated crown fracture to his maxillary central incisors. Following treatment and after 5 years of follow up, the reattached fragment had satisfying esthetics, vitality and function.

**Discussion:** A patient with fractured anterior teeth usually complains of pain and will be emotionally and esthetically affected. An immediate treatment to such patients will not only preserve the natural tooth but also gives positive emotional comfort.

**Conclusion:** With a good presence of mind from the parent and time efficient technique followed helped us achieve an optimal aesthetic result with simultaneous patient and clinician satisfaction. Use of minimal tooth preparation and choosing the fracture line embracing technique along with selection of the right shade of composite resin proved successful in this case.

## **Tooth-whitening Interventions for Children with Necrotic, Traumatized Discoloured Teeth: The Current Stance - UK National Survey**

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**Background:** Tooth-whitening interventions can manage discolouration arising from traumatic dental injuries that may compromise dentofacial appearance. Tooth whitening products are not permitted for use in children where 0.1%≤6% Hydrogen Peroxide is present or released. Indemnity organisations have varying views on the resulting ethical and legal dilemma. Little is reported regarding the current practice and opinion of paediatric dentists in relation to tooth-whitening. The aim was to determine practice and opinion regarding whitening interventions for the management of discoloured teeth in UK consultant-led paediatric dentistry units.

**Methods:** A self-administered, anonymous, snapshot survey was disseminated online via the British Society of Paediatric Dentistry Consultants Branch in June 2019. Data were gathered with respect to local protocols for paediatric tooth-whitening.

**Results:** 15 consultant-led paediatric dentistry units responded. 67% (n=10) provide tooth-whitening interventions. 80% (n=8) of these units have agreed local protocol and patient information describing legislation. 80% (n=8) obtain written consent and 90% (n=9) record pre-operative tooth shade. 80% (n=8) document root filling quality/evidence of periapical healing pre-operatively. Thematic analysis of free-text responses identified concerns about medicolegal challenge and well-being of affected children. Units securing support from Trusts to provide whitening interventions described robust local protocols. A recent shift in the position of UK indemnifiers contributed to a reduction in tooth whitening and apprehension surrounding procedural delivery.

**Conclusions:** In 2019, a majority of UK consultant-led units were routinely undertaking tooth-whitening. National variation in paediatric tooth-whitening persists. Results were shared nationally to inform development of a societal response in advocating for affected children, and to benchmark best-practice standardisation.

### Management of Avulsed Primary Anterior Teeth – A Case Series

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**Introduction:** Prevalence of avulsion injuries in primary teeth varies between 5.8% - 19.4% of all types of traumatic injuries to the primary dentition. It occurs most often in 2–4 year-old children with the maxillary primary central incisor being the most commonly involved. The main causes of avulsions of primary teeth are falls, fights and child abuse. Avulsion of a primary incisor is often associated with luxation injuries to adjacent teeth, fracture of the facial bone and laceration of the surrounding tissues

**Case report:** This presentation focuses on the management of avulsed primary anterior tooth in a two 2.6 year-old and a 3 year-old. All three patients reported with avulsed primary anterior teeth after a trauma due to a fall during play. The patients were examined and treatment plan was custom made based on the ‘International Association of Dental Traumatology’ guidelines.

**Discussion:** Three options are possible for management of an avulsed primary incisor:

(i) No treatment; (ii) Prosthetic replacement of the missing tooth and (iii) Replantation of the avulsed tooth. This decision requires careful examination of the child, a detailed history and complete knowledge of the guidelines. Although data on replantation of avulsed permanent teeth are numerous, the replantation of primary teeth are scant. Systematic search using the terms: “primary teeth, primary incisors, avulsion, exarticulation, replantation” revealed only 17 articles since 1925.

**Conclusion:** The purpose of this presentation is to add an insight on the management of primary avulsed incisors and its sequela with case reports adding evidence to the existing knowledge.

## Dental Trauma

**Dental Trauma in Children: A Retrospective Study in a Trauma Center in Southeastern Brazil**

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**Background:** The aim of this study was to perform a retrospective analysis of the patients treated in a dental trauma center in Southwest Brazil, regarding to the etiological factors, types of trauma and most frequent sequelae in both deciduous and permanent dentition.

**Methods:** Information contained in dental records of 136 patients, from 1 to 12 years old, attended at the School of Dentistry of Ribeirao Preto at University of São Paulo from 2017 to 2018 was collected. Documentation contained information regarding to the first visit and routine follow-ups. Data were converted to percentage for descriptive statistical analysis.

**Results:** Of the 136 patients treated, most were female (55.9%) and 40% reported having suffered previous dental trauma. Dental injuries occurred mostly at home (67%), while 36% occurred at school. Regarding to dental care, 44.1% reported not having received care before coming to the dental center. Spontaneous pain was reported by 11% of patients while 28.7% reported pain during chewing. Lateral dislocation and intrusion were the most prevalent types of trauma, observed in 22.8% and 20.6% of children, respectively. Among the traumatized teeth, 36.1% presented sequelae such as color change (77.3%), pulp necrosis (20.6%), pulp obliteration (6%) and/or external root resorption (4.3%). Traumatized primary teeth led to sequelae in successor permanent teeth in 3.9% of cases.

**Conclusions:** Information regarding the etiological factors, types of trauma and the most frequent sequelae observed in children in a dental trauma center in Southwest Brazil were compiled and can be used in the planning, administration and evaluation of health care actions.



## Dental Trauma

**Knowledge, Awareness and Attitude towards Emergency Management of Dental Trauma among the Parents of Urban Population of Chhattisgarh, India**

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**Background:** The purpose of this cross-sectional study was to assess the knowledge, attitude and awareness level of parents regarding the emergency management of dental trauma and to find out the relation of the responses to social variables.

**Methods:** A total of 200 parents were surveyed over a period of three months using a pretested close ended questionnaire prepared in English, and in the regional language which was divided into three parts: Part 1 contained questions on personal information, Part 2 on an imaginary case of trauma to assess their knowledge regarding trauma management and Part 3 related to their attitude towards dental trauma management education. The data was statistically analyzed using descriptive and chi-square statistics.

**Results:** The overall knowledge of parents regarding emergency management of trauma was not satisfactory. Although most of the people were in favors of taking professional consultation for emergency management of trauma but most of them were unaware of the steps that need to be taken on their part so as to minimize complications and improve prognosis.

**Conclusions:** Educational campaigns are the need of the day to increase the knowledge of parents regarding emergency management of dental trauma.

**Beware: Is a Child Abuse Case Landing in your Dental Set Up?**

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**Background:** Dentists are in a good position to recognize child abuse and neglect cases as 50%-70% of cases present with lesions involving the craniofacial, head and face areas.

**Methods:** A cross-sectional survey was carried out in April 2020 on 100 dentists who had obtained post-graduate training from Delhi-National Capital Region (NCR). A 10-item questionnaire was used to assess their knowledge, awareness and skills regarding detection of child abuse and neglect. Data were subjected to appropriate measures and analyzed using online based survey app “surveymonkey” where one respondent could take the survey questionnaire only once to avoid bias.

**Results:** 75% of dental post-graduate respondents were aware that dental neglect is willful failure of a parent or guardian to seek and follow through with necessary treatment. 70.8% of respondents were able to differentiate between accidental falls and child abuse, and knew that accidental falls lead to uniplanar injuries located on frontal surfaces, while physical abuse leads to multiplanar injuries.

**Conclusions:** An alert pediatric dentist can play a contributing role in identifying cases of child abuse and play a role in early intervention. It is important to educate all health care providers (including dental providers) to be aware of the signs and symptoms of child abuse and neglect, and to know how to respond.

**Dental Avulsion Management in the Mixed Dentition: A Case Report**

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**Introduction:** The treatment of choice for tooth avulsion on permanent dentition is replacement of the avulsed tooth in the alveolar socket. This treatment is not recommended though for the deciduous dentition. This case reports the dental avulsion management of a 7-year-old male patient and its follow-up.

**Case report:** The child's parent reported that the boy had fallen off the couch, leading to the avulsion of teeth 21 and 62. Immediate reimplantation of tooth 21 was performed and the child was referred to the hospital. The patient was brought to dental school on the next day. Clinical and radiographic evaluation revealed: absence of tooth 62; tooth 21(Nola stage-7) in infraocclusion with high mobility; trauma to the supporting tissues of tooth 11 and lip contusion. A semi-flexible splint was placed and parents received the appropriate guidance. On 1 and 2-weeks follow-up, the splint had fallen off and was placed again with bite lift. After 4-weeks, tooth 21 showed high mobility. The patient was asymptomatic and there was radiographic evidence of bone formation around tooth 21 on 12-weeks follow-up.

**Discussion:** The management of dental trauma is challenging. The current scientific evidence should be adapted to the circumstances. In this case, the splint was maintained for 10-weeks due to high mobility found by incomplete root formation and patient's lack in soft eating habits.

**Conclusion:** In this case, the reimplanted tooth is in healing procedure without the need for endodontic intervention. However, subsequent follow-ups should be performed, considering the risk of resorption, necrosis and changes in root development.

**Enamel Hypoplasia of Permanent Successors due to Dental Trauma in Primary Teeth : Three Case Reports**Bilal Özmen, Şeyma İrem Küçük*Faculty of Dentistry, Department of Pediatric Dentistry, Ondokuz Mayıs University, Samsun, Turkey*

**Introduction:** Developmental defects in permanent teeth usually occur as a result of trauma in the primary teeth. Pulp necrosis, tooth discoloration, enamel hypoplasia, ectopic eruption, crown dilacerations can occur on permanent teeth. The purpose of this report is to present the effects and treatments of trauma to primary teeth on their permanent successors.

**Case 1:** An eight years old boy patient's left maxillary central incisor tooth had hypoplasia. Radiolucency was observed on the affected tooth's crown by radiography. Patient's parents reported a history of trauma at the age of two years. As treatment an aesthetic restoration with resin composite was performed.

**Case 2:** An eight years old girl patient's right maxillary central, lateral incisor teeth had hypoplasia. Her parents told a history of trauma at the age of eighteen months. Aesthetic restorations were planned but patient's parents didn't want the treatment.

**Case 3:** A twelve years old girl patient's parents told a history of trauma at the age of two years old. Due to that, her permanent left mandibular three anterior teeth became hypoplastic. Radiographic observation showed radiolucency on the affected teeth's crown. Aesthetic restorations were performed.

**Discussion:** Traumatic primary teeth can cause hypoplasia on the permanent teeth. Direct composite veneer can be used as treatment in enamel hypoplasia. This is easy to apply and repairable. Teeth with a developmental anomaly can also be treated using crowns.

**Conclusion:** Functional and aesthetic needs of patients can be provided by treating hypoplasias in permanent teeth due to trauma to primary teeth.

**Immature Permanent Tooth with a Horizontal Root Fracture: Short Term Follow-Up**

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**Introduction:** Root fractures are rare in trauma cases. Horizontal root fracture occurs often in the middle-third of the root and rarely at the apical-third and coronal-third. In root fractures, the prognosis varies depending on the age of the patient, the stage of root development, the level of the fracture line.

**Case report:** An eleven-year old patient fell on the carpet in the school corridor and presented to our clinic three hours later. There were no medical problems in the history of the patient. In the intraoral examination, tooth number 11 had bleeding in the form of leakage, sensitivity in horizontal percussion and 1 mm extrusion. There were uncomplicated crown fractures in teeth 11 and 21. When examined radiographically, horizontal root fracture was observed in the middle 1/3 of the tooth number 11. After local anesthesia the affected tooth was repositioned with with finger pressure at the first session. A splint was made between teeth number 13-23. After 4 weeks, the splint was removed. With the clinical examination, it was observed that the affected teeth received positive responses to vitality tests. Aesthetic rehabilitation of teeth 11-21 were performed with composite.

**Discussion:** It is important to apply clinical and radiographic examinations, vitality tests and inform the patient about oral care in the diagnosis and treatment of dental trauma.

**Conclusion:** In dental trauma cases, early diagnosis affects prognosis. Improvement in pulp tissue can be followed by vitality tests. Endodontic treatment may not be required for teeth that maintain their vitality.

## Management of Complicated Crown-Root Fracture with Pulp Exposure in Permanent Central Incisor: A Case Report

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**Introduction:** Crown-root fracture with pulp exposure is a fracture involving enamel, dentin, and cementum and exposing the pulp. According to the tooth's situation appropriate treatment could be planned. The principal aim of orthodontically extrusion of fractured tooth is to provide a supra-gingival tooth margin as it can be restored without impinging to periodontium and isolation faults.

**Case report:** 11 year-old boy patient attended our clinic 10 hours after the trauma incident. He fell at school and had a trauma in left permanent central incisor. In clinical examination, the pulp was exposed, palatal fragment was mobile and the fracture line reached to the root surface. In radiographic evaluation, there was no apical radiolucency or fracture on 2/3 apical region of root. The mobile fragment was removed and the root canal treatment was done in one visit. Because of the poor isolation for restoration, the orthodontic extrusion was planned for the traumatized tooth. The braces were applied in first visit as a splint. The permanent restoration was applied and then finally the retainer was bonded to palatal region of incisors. After clinical and radiographical evaluations done in 1,3,6,12,24 month follow-ups, there is no sign of radiolucency, resorption, discoloration, mobility or abscess.

**Discussion:** After orthodontically extrusion, the isolation can be ensured for the appropriate restoration. The disadvantages of the orthodontically extrusion are the esthetic concerns and long treatment period.

**Conclusion:** Orthodontic extrusion is a non-invasive and mostly reliable choice in crown-root fractures. Children also can tolerate the treatment and cooperate with the practitioner.

### Replantation of a Primary Lower Incisor after 16 Hours of Avulsion

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**Introduction:** Literature of the management of primary avulsed tooth shows no consensus on the procedure. Arguments supporting the primary teeth replantation are based on the prevention of several problems such as loss of space, impair aesthetics, delayed eruption, and malposition of permanent tooth.

**Case report:** A feminine patient, 2 years 11 months old, was taken to dental paediatric consult in a social security health institution for oral trauma. The patient was taken to the emergency room after the incident, (16 hours before dental appointment), where only antibiotics and anti-inflammatories were prescribed. Intraoral examination showed avulsion of the primary left lower lateral incisor, pending from the vestibular mucosa, and mobility of adjacent teeth. Reimplantation of the tooth and splint was selected as treatment. Extraorally instrumentation of the conduit and filling with calcium hydroxide and iodoform was performed before reimplantation. Final examination was conducted 3 years after the accident. Permanent lower incisors were present with no evidence of apparent structure damage, no hypoplasia or Turner tooth.

**Discussion:** In middle income countries, accessibility to oral health care services and socioeconomical factors, can interfere with the choice of a treatment with better prognosis. Avoiding elevated costs of treatment from space maintainers or prosthetic procedures may be one a reason for replantation of primary teeth.

**Conclusion:** This case can be considered successful despite not presenting the ideal conditions for the treatment, since there was no presence of dental mobility, discoloration of the crown or other alterations commonly reported in the literature as failure.

### A Modernist Intervention to Regenerative Endodontics

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**Introduction:** Management of necrotic young permanent teeth poses greater endodontic challenge to the clinicians. Regenerative endodontics involves the interplay of three key elements of tissue engineering—stem cells, scaffolds, and growth factors. Along with this, efficient root canal disinfection plays a major role. These procedures rely heavily on root canal disinfection. Traditionally used irrigants and medicaments were reported to show drawbacks. Therefore, the purpose of the report is to present the results of laser assisted disinfection in regenerative endodontic cases.

**Case Report:** Case series describes about the management of four cases of necrotic young permanent teeth. Cases were treated using laser assisted disinfection method. Platelet rich fibrin or blood clot was used as a scaffold and coronal seal was given using Mineral trioxide aggregate and final restoration was placed.

**Discussion:** This report of pulp regeneration showed that laser assisted disinfection combined with PRF or blood clot scaffold systems lead to apical closure and increasing radicular thickness in necrotic young permanent teeth. Laser assisted disinfection has been confirmed as an effective adjunct for root canal disinfection. Several studies have shown the benefit of laser assisted disinfection and reduction of bacterial load in infected root canals.

**Conclusion:** This is the rarest case series which documents the efficacy of a new disinfection protocol in pulp regeneration which showed consistent and successful results.



## Dental Trauma

**A Multidisciplinary Approach to The Traumatically Intruded Immature Lower Permanent Incisor: 4 Years Follow-Up**

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**Introduction:** Intrusion causes damage to periodontal ligament fibers, neurovascular bundles, and alveolar bone. Intrusive luxation in the permanent dentition is an uncommon trauma injury. The purpose of this report is to present the long-term follow-up intrusive luxation trauma.

**Case Report:** A healthy 8 year-old girl was reported with the intrusion of the lower-left incisor (31). She had an accident when she opened a bottle cap with her tooth. Her parent did not know when it happened. Clinical examination revealed that the tooth was located 4mm on labially and intruded 2mm. The patient had sensitivity to palpation, but no pain. 21 was localized palatally. Radiographic examination revealed 21 and 31 that had an immature apex. There was no evidence of fracture on the radiograph. 31 became into a cross bite with 21.. Maintainer with vestibular arch modified U loop and acrylic block was applied for 3 months and controlled every week. 31 was repositioned lingually with the vestibular arch that was activated. After 3 months, 31 reached its original position in complete alignment and pulp was vital. The patient was recalled every year throughout 4 years and teeth were healthy. 31 and 21 showed complete apical closure.

**Discussion:** A multidisciplinary approach is required for the intrusion. The pathological results could appear such as radicular external/internal inflammatory resorption, partial/total pulp canal obliteration, ankylosis, marginal bone loss, and gingival recession. Pulpal necrosis and disturbance of continued development of roots are commonly seen in immature teeth.

**Conclusion:** A multidisciplinary approach could provide complete rehabilitation of a traumatically intruded developing tooth.

**A Retrospective Study on Treatment of 53 Intruded Permanent Teeth in Children and Adolescents**

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**Background:** There is a lack of clinical data on the traumatically intruded young permanent teeth in Chinese children and adolescents. This study aims to analyze the incidence of complications and related factors in intrusive luxation.

**Methods:** Clinical data of traumatic intrusive luxation in 6 to 18-year old-patients treated in the Department of Pediatric Dentistry, PKUSS were reviewed. Teeth were treated by awaiting re-eruption, orthodontic repositioning or surgical repositioning. The incidences of pulp necrosis, root resorption and marginal bone loss were calculated, and the relationship between treatment and complications were analyzed.

**Results:** Fifty-three intruded teeth in 39 patients were included in the study. Incidences of pulp necrosis, root resorption and marginal bone loss were 66.0%, 47.2% and 32.1%, respectively. In teeth with more than 3mm intrusion, those receiving orthodontic or surgical repositioning had a higher rate of root resorption and marginal bone loss than those awaiting re-eruption, but not in teeth with

**Conclusions:** Orthodontic or surgical repositioning were significantly related to root resorption and marginal bone loss in teeth with more than 3mm intrusion. Fast orthodontic movement resulted in higher incidence of root resorption, and appropriate extension of splinting period might promote marginal bone healing.

**Relationship of Obesity with Dental Trauma in Preschool Children: A Case-control Study**

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**Background:** Traumatic Dental Injuries (TDI) are very prevalent in primary dentition and can have a negative impact on the quality of life of preschool children and their families. Obese children are more prone to fall, which increases the chances of physical injury. Thus, the objective of this case-control study was to determine the association between obesity/overweight and TDI in preschool children.

**Methods:** The case group was selected from those children with TDI identified by clinical examination (n = 262). Each preschool identified as a case was paired through a drawing with a colleague of the same age, sex and preschool, but who did not have TDI, the control group (262). TDI were assessed using the Andreasen criteria and the presence of an increased overjet was considered when  $\geq 3$ mm. The children's weight and height were measured to calculate the Body Mass Index. Sociodemographic and sucking habits variables were collected through questionnaires. Data analysis involved frequency distribution, chi-square test and univariate and multivariate logistic regression.

**Results:** The final sample consisted of 253 children in each group. Among the children in the case group, 32% (n= 81) were obese and in the control group 22.5% (n= 57). Obese children were more likely to have TDI than children with normal weight (OR=1.54; 95%CI:1.02-2.34; p=0.03). The anterior open bite was considered a risk factor for TDI (OR=3.47; 95%CI:1.58-7.63; p=0.002), as well the increased overjet (OR=2.26; 95%CI:1.42-3.60; p=0.001).

**Conclusion:** Obese children were more probability to have TDI in primary teeth than children of normal weight.

**Management of Root Fractures in Immature Maxillary Permanent Incisors: A Case**

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**Introduction:** Root fracture in developing permanent incisors is uncommon and results from a horizontal impact that is transverse to oblique in direction. The incidence is generally in the middle third of the root more than at the apical and cervical thirds. A careful early diagnostic evaluation of such injuries is obligatory to accomplish an appropriate minimally invasive treatment plan.

**Case report:** Three cases of root fractures in immature maxillary incisors in early mixed dentition are presented. Clinical management was based on minimal endodontic intervention. Treatment was decided depending on the fracture line, fragments position, and the extent of root involvement. Management steps included careful diagnosis; continued re-evaluation followed by a conservative treatment approach. The observed prognosis was directly related to coronary fragment displacement, stage of root and pulp development, and type of splinting and fracture localization.

**Discussion:** For ideal healing and repair by pulp dentin complex formation, the pulp of the traumatized tooth must be intact, and the coronal fragment should not be dislocated. This helps in keeping pulp tissue vital and allows the mobility of the tooth within certain physiological limits. Also, age and stage of development along with many other factors, decide the prognosis of root fracture.

**Conclusion:** Minimum intervention endodontic approach promotes favorable uneventful healing of root fractures in developing incisors provided with a suitable microenvironment.

## Effect of Hypoxia on Expression of DEC1 and DEC2 Genes Along-with Proliferation and Migration of Human Cementoblast Cells

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**Background:** Cementoblasts comprise of lesser studied cell line of periodontium. Compression and mechanical tear after luxation injuries in children, peri-radicular lesions and cysts secondary to trauma cause hypoxia. The present study aimed to evaluate the effect of hypoxia on expression of DEC1 and DEC2 genes along-with proliferation and migration of human-cementoblasts.

**Methods:** An in-vitro experimental study was conducted using immortalised human-cementoblast cell-lines (HCEM-2). Hypoxia was created by using Mitsubishi AnaeroPack-anaero in airtight container, incubated at 37-degree centigrade with 5% CO<sub>2</sub> in a humidified atmosphere. Effect of hypoxia was studied at periods of 24 hours, 48 hours and 72 hours using MTS assay for cell proliferation, wound healing assay (Ibidi, Germany) for cell motility and RT-PCR for gene expression of DEC1 and DEC2. HCEM2 under normoxia were taken as control.

**Results:** Cell proliferation was significantly reduced due to hypoxia at all times. It was less than half of that of normoxia after 72 hours. Wound healing assay revealed cementoblast motility to be reduced by hypoxia with a uniform trend from 24 to 72 hours. Expression of DEC1 and DEC2 was negligible in normoxia at 24 hours which further reduced at 48 hours and was absent at 72 hours while their expression was significantly high at all times in hypoxia.

**Conclusion:** The present study observed its detrimental effects on cementoblasts causing up-regulation of circadian-clock genes linked with autophagy and energy metabolism. These pathways need to be understood to develop tissue engineering based solutions for managing external root resorptions in children and adolescents.

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**Revascularization: Treatment of Choice in Non-Vital Tooth: A Case Report**

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**Introduction:** Pulp necrosis of young permanent teeth will ultimately lead to thin and fragile canal walls and open root apex. Recently it has been shown that necrotic immature teeth can be treated by regeneration which is dependent on the ability of residual pulp and apical stem cells to differentiate and allows root growth, thickening of dentinal walls and closure of open apex. This case report describes the treatment of necrotic immature tooth by pulp revascularization.

**Case report:** Patient reported with history of trauma three years ago. Radiographs revealed immature apices associated with maxillary central incisors. Local anaesthesia was administered and rubber dam was placed, and a conventional endodontic access opening was made, and the canals were irrigated copiously with 5.25% sodium hypochlorite solution alternatively with normal saline solution, and minimal instrumentation. Triple antibiotic paste was placed in the root canal. The patient was recalled after 1 week and intracanal medicament was flushed with 5.25% sodium hypochlorite solution and EDTA. Revascularization was performed in right central incisor. Patient was recalled after 3, 6 and 12 months respectively for clinical and radiological evaluation that showed appreciable thickening and elongation of dentinal walls of the central incisor along with root end closure and elongation and healing of periapical radiolucency.

**Discussion:** Advantage is obturation is not required that eliminates the chance for root fracture during lateral condensation. Disadvantage is susceptibility to further pulp disease and may require retreatment.

**Conclusion:** For necrotic immature teeth, revascularization is a desirable alternative to apexification and shows both good short-term and long-term prognosis.

## Dental Trauma

**An Investigation of Transitional Care Pathways for Young People who have Experienced Traumatic Dental Injuries**

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**Background:** Traumatic dental injuries (TDIs) can cause severe and complex dento-alveolar injuries. Management of TDIs frequently extends into adulthood, therefore a clear transitional care pathway (TCP) is required. Failure of this can prevent engagement with adult dental services and negatively influence treatment outcomes. This study aimed to assess the availability of TCPs from paediatric to adult specialist care for young people with TDIs.

**Methods:** An anonymous, voluntary, postal survey was designed, piloted and administered to all UK specialists in Paediatric Dentistry registered with the General Dental Council. Quantitative data were analysed using descriptive statistics, free text responses were analysed using thematic analysis.

**Results:** The response rate was 58% (n=130). 64% (n=83) worked primarily in hospital dental services, with 28% (n=37) in community dental services. 55% (n=72) stated that there was a dental trauma clinic for children within their locality, only 22% (n=29) stated that there was a dental trauma clinic for adults. 69% (n=90) stated that there was no clear TCP within their locality. 41% (n=37). These data highlighted need for a TCP, identifying access to resources and barriers to TCP provision. 13% (n=31) refer to specialist adult services following treatment for a patient aged 12 or above, with 41% (n=95) continuing to provide follow-up within paediatric dentistry.

**Conclusions:** Follow-up arrangements for young people with TDI's differ across the UK, with inconsistent availability of TCPs. Informal pathways involving referral to multi-disciplinary teams may be utilised for follow-up care. Development of a TCP may aid in developing a consistent approach to long-term management of TDIs.

**Endocrown Restorations of Immature Permanent Teeth with Complicated Crown Fractures: A Case Report**

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**Introduction:** Complicated crown-root fractures are relatively rare type of dental traumatic injury with several endodontic and restorative challenges. The aim of this case report is to present management of complicated crown fractures of immature permanent incisors using endocrown restorations.

**Case Report:** A 9-year-old boy patient referred to pediatric dental clinic with a history of dental trauma that occurred 3 hours previously on his maxillary four permanent incisors due to schoolyard accident. Extra-oral examinations showed swelling of the lips and soft tissues. Intra-oral examination revealed complicated crown fracture of all maxillary permanent incisors at the gingival margin level. Also, the patient had severely pulp sensitivity in his related teeth. Radiographic examination showed immature root development of maxillary incisors. In order to encourage root development, the injured incisors were pulpotomized with White MTA and then they were restored with the endocrowns.

**Discussion:** The treatment presented here offers a simple and effective method for restoring severely fractured immature permanent incisors that re-establishes function, shape and esthetics.

**Conclusion:** At the 12-months follow-up, clinically the restored teeth showed acceptable function and aesthetic results. The radiographic examination showed continued thickening of root canal walls, and apical closure by narrowing of the apical foramen.



**Dental Traumatic Injuries in Babies aged 0-20 months in Brasília: Cohort Study**

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**Background:** Traumatic dental injuries (TDIs) is one of the most frequent oral health concerns in primary dentition. The aim of this study is to evaluate the prevalence of TDIs in babies aged 0-20 months in Brasília.

**Methods:** A total of 409 babies up to 20 months of age, belonging to a birth cohort study at the University Hospital of Brasilia were recruited from August 2017 to July 2018. The parents were interviewed and a questionnaire containing questions about oral health and TDIs was applied. After that, a clinical examination was performed to evaluate signs of trauma in primary teeth. A descriptive statistical analysis of the data was obtained.

**Results:** A total of 209 (51.10%) were boys and 200 (48.89%) were girls. The mean ( $\pm$ SD) age of babies was 12.36 ( $\pm$  1.25) months. Of the babies, 55.99% had some oral trauma. The prevalence of soft tissue injuries and TDIs was 46.94% and 19.3%, respectively. Regarding TDIs, 116 teeth were affected. The upper right central incisor (43.10%) was the most affect tooth, followed by the upper left central incisor (31.03%). Regarding dental care-seeking, the most of mothers (97.81%) reported did not seek dental care.

**Conclusion:** The prevalence of TDIs was high in the age range evaluated. Mothers should be informed to seek dental care right after TDIs to receive adequate follow-up and prevention strategies.

**Evaluation of Traumatic Dental Injuries In Children Turkey during The COVID-19 Pandemic**

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**Background:** The impact of the coronavirus (COVID-19) disease caused by the single-stranded RNA virus, SARS-CoV-2, has had a profound impact on daily lives.

This is the first study in Turkey to determine the prevalence, etiology, classification of trauma, teeth involved, place of injury and treatment received after dental trauma during COVID-19 pandemic. The aim of this study is to investigate the changes that may have occurred in the dental trauma pattern of children whose routine school and daily activities are affected during the pandemic.

**Methods:** The records of 0-13 year-old patients who applied to the Department of Pedodontics of Ondokuz Mayıs University Faculty of Dentistry between March-July 2020 were examined and statistically evaluated. The causes and localization of trauma, traumatized teeth classification have been investigated.

**Results:** A total of 504 patients aged 0-13 years were screened. 22 children suffered trauma (4.36%). 15 of dental traumas occurred at home (1.46%) followed by at street (n= 7, 3.14%). The most common reason of dental trauma was falls (n = 15, 68%). The most commonly affected tooth was the maxillary left permanent central incisor in both dentition (n = 8, 36.3%). The most common type of trauma was subluxation (n=7, 31.8%) for permanent dentition and luxation (n=6, 27.2%) for primary dentition. No significant difference was found between genders (1:1.2).

**Conclusion:** Despite the low prevalence of dental trauma in Turkey eastern black sea during pandemic, it is recommended to plan a community wide trauma prevention campaign targeting parents, children and health care specialists.

**Factitious Injury Presented as an Indiscriminate Red Patch in a Young Child: A Case Report**

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**Introduction:** Self-injury to the gingiva is a rare but serious finding amongst children and adolescents. The most common cause is picking/scratching of the gingiva using fingernails. These lesions are far more common in children compared to adults.

**Case Report:** A 3-year-old, medically unremarkable girl was referred by her General Dental Practitioner to the Paediatric Department, University Dental Hospital of Manchester regarding a red patch around her maxillary deciduous incisor gingivae. The accompanying parent was unsure of the duration the lesion had been present. The patient did not describe any symptoms and there was no history of dental trauma. The URA and ULA presented with 3mm gingival recession [DM(MUNF1)] but were otherwise unremarkable. The labial gingivae showed several marks characteristic of fingernail induced self-injury. Both the parent and child were re-assured, and advice was provided to break the habit. An intensive oral hygiene routine was implemented, and close follow-up planned.

**Discussion:** This case highlights the importance of considering factitious injury as a differential diagnosis of localised soft tissue lesions that may present with an initially challenging clinical picture. Follow-up is required to monitor progression and consider further investigations if the clinical presentation changes. A complete clinical and social history is necessary for a comprehensive assessment.

**Conclusion:** Habit breaking techniques are often effective in the cessation of self-injurious habits. If they are recognised and stopped early, the child can be prevented from causing extensive gingival and periodontal damage and subsequently having to undergo potential non-surgical and surgical periodontal therapy in later life.

### **Knowledge, Attitude and Practice of Autotransplantation among the Practicing Pediatric Dentists in Chennai: A Questionnaire Study**

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**Background:** Autotransplantation is a minor surgical procedure which involves transplantation of tooth within the same individual. For children, autotransplantation may be considered as a provisional measure with good survival probability. It offers viable biological approach for replacing the missing teeth and also for orthodontic treatments in children.

The aim of this study is to assess the knowledge, attitude and practice of autotransplantation among pediatric dentists in Chennai, India.

**Methods:** An 18 item questionnaire was developed, piloted and distributed among 100 practicing pediatric dentists in Chennai, India.

**Results:** Seventy valid responses from the practicing pediatric dentists were obtained. Among them, 39.7% had an experience of 5-10 years, 47.1% practiced less than 5 years and 13.2% had an experience more than 10 years. Analysis of the responses showed that 76.5% of the pediatric dentists were aware of the procedure but haven't observed autotransplantation being done. Among the respondents 95.6% haven't performed this technique and 40.6% of them weren't sure of the prognosis. Atraumatic extraction of donor tooth was considered to be a major limitation in autotransplantation by 41.8% of the pediatric dentists. From the responses received 95.6% were interested in gaining more information with majority opting for more hands on and workshops on the technique of autotransplantation.

**Conclusions:** Though many of the respondents were aware of the procedure almost 95.6% of them haven't practiced the same and the common reason cited is due to inadequate training. Thus adequate clinical training is necessary on autotransplantation procedure for its use in pediatric dentistry.

## **Multi-dimensional Approach to the Successful Management of Intrusive Traumatic Dental Injuries: A Case Report**

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**Introduction:** Intrusive luxation is a form of traumatic dental injury in which the affected tooth is displaced deeper into the alveolus. It accounts for 3% of all the traumatic injuries in permanent dentition. According to BSPD, the severity of intrusion can be classified as mild (3mm); moderate (3-6 mm); and severe (6mm). Despite the variety of treatment modalities, rehabilitation of intruded teeth poses a challenge and a multidisciplinary approach is important to achieve a successful result.

**Case report:** This case report describes a multidisciplinary management of an intruded permanent central incisor of a 12 year-old child who reported to the Department of Pediatric Dentistry. Intra-oral examination revealed soft tissue injuries with displaced and mobile teeth. On radiographic examination, intrusion w.r.t 11 was observed. Orthodontic repositioning of 11 was performed followed by splinting of the tooth. Further, the tooth was endodontically treated and a regular follow-up was done. Clinical and radiographic examination showed satisfactory apical and periodontal healing.

**Discussion:** The management of intrusive luxation ranges from allowing for spontaneous re-eruption to orthodontic or surgical repositioning depending on the severity of intrusion. In this case, the tooth was intruded 4mm and so orthodontic repositioning was planned followed by splinting for 4 weeks. Later endodontic treatment of the tooth was performed.

**Conclusion:** The present case report shows a successful multidisciplinary management of intrusive luxation injury. Traumatic dental injury is one such integrated model wherein people from multiple disciplines of dentistry work together in addressing a common challenge.

**Treatment of a Severely Intruded Permanent Central Incisor after Delayed Presentation**

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**Introduction:** Optimal outcomes following traumatic dental injuries (TDI) depend on the stage of root development, timely management, and regular follow-up visits with a dentist.

Intrusive luxation is one of the most severe types of TDI, comprising 0.5-1.9% of all TDI in permanent dentitions. In cases with a high degree of intrusion, there is higher risk of root resorption and ankylosis, with potential long-term tooth loss.

**Case Report:** An eight-year old male was referred to the Community Dental Services by his dentist for TDI assessment and treatment. He had sustained complete intrusion (7mm) of his upper left central incisor (21) 12 months prior to this assessment, with subsequent failure to re-erupt. The intra-oral radiograph showed an open apex with no visible root fractures associated with 21. The patient was referred onwards for surgical exposure and repositioning, however by this time 21 spontaneously re-erupted. The patient remains asymptomatic 18 months after orthodontic repositioning of this tooth.

**Discussion:** Immediate referral for specialist input is indicated for severe intrusion as rapid orthodontic or surgical repositioning is likely to be required. A delay in treatment can significantly increase the risk of complications, such as ankylosis, leading to tooth loss. The psychological impact of injury to an anterior tooth for this length of time cannot be underestimated.

**Conclusion:** It is imperative that the dental team are aware of paediatric dental trauma guidelines to optimise outcomes with timely intervention.

## **The Interesting Presentation of an Avulsed Fractured Incisor for Space Maintenance in a Complex Dental Trauma**

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**Introduction:** The management of complex dental trauma to permanent incisors can be challenging. It is important to consider the long term effects of our treatment, in particular the maintenance of bone volume.

**Case Report:** An 11 year-old sustained a complex dental trauma a day before presenting to our clinic. UR1 had a horizontal mid-root fracture and enamel-dentine fracture. UL1 was avulsed and had a coronal third root fracture. Two hours after the injury, the general dental practitioner re-implanted the UL1 coronal fragment only, without the apical root fragment being located. UR1 crown had been restored and a rigid splint placed palatally from UR2 to UL2.

Three months following the injury, an upper removable appliance was provided to replace the poor prognosis UR1 following elective extraction of the coronal portion and burial of the remaining root due to symptoms developing. Radiographic monitoring of the reimplanted fractured UL1 revealed significant bony infill replacing the apical two thirds. Clinical monitoring showed good healing around the remaining coronal third of the root with no increased mobility or pocketing, preventing space loss.

**Discussion:** Interestingly, despite missing the apical third, the UL1 has been a useful space maintainer and responsiveness to sensibility testing has been maintained. We are aware this tooth will ankylose and infra-occlusion will need to be monitored. Maintaining bone volume through decoronation allows for the provision of dental implants in the future.

**Conclusion:** This case shows a stepwise approach in managing dental trauma and highlights the complexities of treatment planning to allow for improved future outcomes.

## Dental Trauma

**Multidisciplinary Management of Complicated Crown Root Fracture in a Maxillary Central Incisor: A Case Report**

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**Introduction:** Accidental trauma to a child's dentition is one of the most distressing incidents for not only the child but also the parents. Of the various traumatic dental injuries, management of complicated crown root fractures of young permanent anterior teeth is indeed a challenge as it more often needs a multidisciplinary management. This case report presents the management of such a traumatic dental injury according to IADT guidelines.

**Case report:** An 11 ½ year old male child reported to the pediatric dental department with a complicated crown root fracture in upper central incisor. Endodontic management was done by root canal treatment followed by placement of a Fibre post. Orthodontic extrusion and proclination of tooth were done using 2 by 4 appliance. Periodontal management was done by improving the gingival margin with frenectomy. Adequate crown length was achieved by raising an apically repositioned flap. Post endodontic restoration with acrylic jacket crown brought back the patients smile.

**Discussion:** Traumatic injuries of the teeth and their supporting structures continue to be a challenge, which every dental professional must be prepared to assess and treat efficiently. A multi-disciplinary approach explores the best possible treatment options for such injuries thereby preserving not only the tooth but also alveolar bone. This would not be possible if extraction is chosen over such an approach.

**Conclusion:** The present report shows an attempt for a bioesthetic reconstruction by following a multidisciplinary approach.



## Dental Trauma

**Influence of Timely and Correct Treatment of Dental Trauma on the Preservation of Injured Teeth Vitality**

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**Background:** The treatment of dental trauma is primarily aimed at preserving the vitality of the injured teeth. The aim of study was to assess the preservation of the vitality of injured teeth under conditions of timely treatment and compliance with International Association of Dental Trauma (IADT) treatment guidelines.

**Methods:** The study included 17 patients aged 8 to 16 years with dental trauma, who visited university clinic. The diagnoses were: 6 uncomplicated and 3 complicated crown fractures, 2 subluxations, 1 extrusive, 1 intrusive and 2 lateral luxations, 1 avulsion, 1 root fracture. All patients visited a dentist within the first week after injury. The patients were divided into two groups: 11 patients who came directly to university clinic (their observation and treatment was carried out according to the IADT treatment guidelines) and 6 patients who came from the other clinics after a delayed time after injury, during which observation and treatment were carried out irregularly.

**Results:** We identified and treated: 19 central and 5 lateral maxillary incisors and 1 central mandibular incisor. Among the patients of the first group, no complication was detected, and the teeth vitality was preserved in six patients. The injured teeth of all patients of the second group lost vitality and 4 had complications at the first visit to university clinic: radicular cysts, chronic post-traumatic periodontitis, in combination with pathological root resorption.

**Conclusion:** A timely visit to a dentist in case of dental trauma and adherence to IADT treatment guidelines makes it possible to preserve the teeth vitality and avoid complications.

## **Regenerative Treatment of an Immature Two Times Traumatized Tooth with Platelet Rich Fibrin: A Case Report**

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**Introduction:** Regenerative endodontic treatment is a successful method with the potential to heal necrotic pulp that may be beneficial for the root development of immature permanent teeth. The aim of this report is to present a patient whose treatment was successful despite being traumatized for the second time during treatment.

**Case report:** A seven-year-old male patient was referred to our clinic with necrosis due to trauma in the right upper central incisor. The canal was minimally instrumented and effectively irrigated with 20ml of 2.5% NaOCl. The canal was dried and Ca(OH)<sub>2</sub> paste was placed inside the root. On the same day, the patient referred to clinic with a root crack in the coronal region caused by second trauma. Ca(OH)<sub>2</sub> paste was renewed but wasn't required to splint due to absence of mobility. To avoid leakage from the cracked area, that area was also sealed with MTA. After 21 days, Ca(OH)<sub>2</sub> was removed, the Platelet Rich Fibrin (PRF) was placed into the canal till the level of cemento-enamel junction and 3mm of white MTA was placed directly over the PRF clot. A week later, for the setting of MTA, the patient was recalled and tooth was sealed with zinc phosphate cement and composite restoration. The patient was reviewed radiographically and clinically at 3,6,12,18 months.

**Discussion:** It was observed that the tooth was asymptomatic, the canal wall thickened and the root elongated.

**Conclusion:** Based on the 18-month results of this case, it appears that PRF supported treatment is a successful method for regeneration of vital tissues in necrotic teeth.

**Association between Malocclusion and Dental Trauma Severity in Primary Teeth: A Retrospective Study**

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**Background:** The literature does not clearly state if the type of malocclusion is associated with a specific type of trauma and the severity of the injury. This retrospective study aimed to assess the occlusal condition in children with traumatic dental injuries of the primary teeth, and the association between the occlusal characteristics and the type and severity of injuries.

**Methods:** Data was collected from records of children treated at a dental trauma center in Brazil over a period of 16 years, including age, sex, etiology of the dental trauma, place of occurrence, number of affected teeth, type of trauma, and injury severity. The occlusal condition was assessed by a trained dentist using photographs of the patients from their first visit. Chi-square tests and Poisson regression were used for data analyses.

**Results:** This study included 209 patients with primary dentition, and most were aged between 2-4 years. Multivariate regression analysis showed that children with anterior open bite had a 47% higher prevalence of severe trauma than those who did not have this malocclusion, and those with class II canines had a 56% higher prevalence of severe trauma than those with class I and III canines. Children with anterior open bite had a 46% higher prevalence of injuries affecting multiple teeth than those without anterior open bite.

**Conclusions:** Anterior open bite and class II canine relationship were associated with a higher prevalence of severe traumatic dental injury in primary teeth, and anterior open bite was associated with trauma affecting multiple teeth.

## Dental Trauma

**Atypical Root Resorption in Primary Teeth in a Girl with a Habit of Lip Sucking and Dental Trauma: A Case Report**

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**Introduction:** Orofacial trauma is an important oral and general health problem. The root fractures in the primary teeth are an uncommon dental injury, comprising 2 to 4 percent, due to the plasticity of the developing alveolar bone. Atypical root resorption (ARR) also known as irregular or circumferential root resorption, is a radiographic finding that has been defined as superficial resorption associated in cases digit-sucking and root fractures in deciduous teeth.

**Case report:** A 38-month-old girl came to the dental university clinic with pain after an accident at school, where she injured her upper incisors. Her mother said the girl had lip sucking habit. Intraoral examination showed a blood clot covering the gingivae of the maxillary central incisors, besides the injured teeth had a grade 2 mobility, without displacements signs. Periapical radiograph revealed a horizontal radiolucent line in the middle third root as well as apical root resorption of both maxillary central incisors. The root-fracture teeth were splinted for 4 weeks with a flexible wire composite splint. At the 16-month follow-up, it was found ARR without discoloration signs or pathologic mobility.

**Discussion:** Atypical root resorption, which is observed on radiographs of primary incisors, has been reported in the dental literature to result from digit sucking; and also any association between ARR and traumatic dental injuries

**Conclusions:** The findings of this case report support the non-nutritive sucking habits and root fracture are a risk factor related to ARR.

**Orthodontic Management of Traumatically Intruded Permanent Maxillary Central Incisor - A Case Report**

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**Introduction:** The incidence of traumatic dental injuries varies with age, with peak incidence at 8 to 10 years. The severe form of traumatic dental injury such as intrusion luxation leads to tooth displacement deep into the alveolar bone. This case report aims to emphasise the importance of immediate orthodontic traction of traumatically intruded mature permanent teeth with closed root apex.

**Case report:** A 10-year-old girl presented with the chief complaint of missing tooth and pain in the upper front tooth region of the jaw following a sport accident in the previous day. On clinical evaluation the patient presented with a missing upper permanent right central incisor at the site of trauma. OPG and IOPAR revealed 6mm intrusion of tooth into the alveolar bone. The treatment was initiated with immediate orthodontic traction of the traumatically intruded tooth followed by endodontic treatment. Subsequently the tooth was orthodontically aligned and stabilized with fiber reinforced composite resin bonded splint.

**Discussion:** In this case, since the intruded tooth had a fully-formed root with completely closed apex spontaneous re-eruption was not possible and therefore immediate orthodontic extrusion was initiated aiming to minimise the chance of ankylosis, followed by endodontic treatment to avoid the development of external root resorption, which can lead to tooth loss.

**Conclusion:** The immediate orthodontic extrusion to reposition the traumatically intruded tooth was effective. Hence, easy access for pulp extirpation was achieved which resulted in a successful treatment outcome at a 1 year follow up duration.

## Management of Traumatic Dental Injuries in the Emergency Department

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**Background:** Favourable outcomes following traumatic dental injuries (TDI) rely on patients receiving appropriate treatment and adequate post-operative advice for aftercare and follow-up. In the UK, patients experiencing a TDI “out of hours” are usually seen by an on-call maxillofacial trainee in the Emergency Department (ED) for immediate management, then discharged for follow-up with their dentist.

**Methods:** Records of patients attending ED with a TDI between May-October 2018 were retrospectively reviewed. All patients were treated by on-call maxillofacial trainees. Data was analysed in Microsoft Excel.

**Results:** 33 paediatric patients presented with a TDI. Documentation of mechanism of injury was completed in 100% of cases. Documentation of all other trauma areas were as follows: time of injury (94%), location where injury sustained (91%), associated loss of consciousness (88%), tetanus status (70%), diagnosis (73%). According to documentation, verbal post-operative advice was given to 61% of patients and only 15% received a written post-operative advice sheet. A dental trauma pro forma was introduced to assist with record-keeping and act as a takeaway advice sheet for patients in order to aid post-operative compliance and follow up treatment with their dentist. Implementation of this pro forma improved documentation in all areas, when re-assessed after six months.

**Conclusions:** A dental trauma pro forma is a useful tool in the busy ED; it allows a standardised approach to record-keeping and improvement in patient-dentist communication following ED discharge. Accurate and thorough record-keeping of TDI may also help to highlight possible safeguarding concerns and is therefore of vital importance.

### **Compare the Effectiveness of Topical Anesthetic Gel and Acupressure Points as a Pre Injection Anesthetic Technique in Pediatric Dental Patients**

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**Background:** Adequate Pain management is mandatory for effective treatment in pediatric patients. There are several pharmacological and non-pharmacological pre injection anesthetic technique of which Lignocaine hydrochloride 2% gel is the most commonly used. Recently Acupressure has been proven to alleviate pain associated with needle prick. The aim of the present study is to compare the effectiveness of topical anesthetic gel and acupressure points as pre injection anesthetic techniques in pediatric dental patients.

**Methods:** After obtaining ethical clearance from institutional review board (SRMU/M&HS/SRMDC/2020/PG/002). Sixty patients aged 6-8 years were recruited for study and randomly divided into three groups of 20 each. Group I patients received topical anesthetic gel (2% lignocaine hydrochloride) as pre injection anesthetic. For Group II patients Acupressure beads were placed in Shenmen, Xiaguan, Yingtang(extra one) points for 30mins as pre injection anesthetic. Group III patients received both Acupressure and topical anesthetic gel . Videos were recorded during the procedure and were evaluated using FLACC pain scale by the trained individual blinded from the study. The data was subjected to statistical analysis.

**Results:** Group III showed least FLACC scores and is statistically significant ( $p < 0.05$ ). When comparing Group I and Group II FLACC scores were not found to be statistically significant ( $p = 0.38$ ).

**Conclusions:** This study demonstrates that Acupressure is equally as effective as topical anesthetic gel. Acupressure and topical anesthetic gel showed maximum reduction in FLACC scores. Therefore, Acupressure as an adjuvant with topical anesthetic gel is effective for pain management in treating pediatric patients.

### **Incisor Overjet: A Risk Factor for Dental Trauma in School Children Aged between 7-15 years: A Cross Sectional Prevalence Study**

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**Background:** This cross sectional prevalence study was aimed to assess the incisor overjet and prevalence of traumatic dental injuries among 7-15 years old school children in Coorg, India.

**Methods:** Total 4036 school children of aged 7-15 years, participated in this study. Children identified with traumatic injuries were further examined for the type of traumatic injuries using modified Garcia-Godoy's classification, along with measurement of incisor overjet and lip incompetence. Additionally, structured interviews were conducted for the history of traumatic injuries to record time, place and cause of trauma.

**Results:** The results showed 3.17% had suffered traumatic injuries. Children with incisor overjet greater than 3.5 mm and presence of lip incompetence had significantly ( $p$  value 0.001) more prevalence of traumatic injuries. Enamel-dentin fracture without pulpal involvement was the commonest type of trauma, mostly involving maxillary central incisors. Boys were 2.76 fold more prone to trauma than girls. The common cause for trauma was play (64.1%) while the place of occurrence was home (63.3%). The age group of 10-12 years experienced 53.1% injuries.

**Conclusions:** Being a pioneer study in the region, it establishes a base line data regarding the prevalence of traumatic teeth injuries and its correlation with various confounding factors for the population. Besides, inferences of the study have implications for preventive and interceptive strategies in the mixed dentition stage of children for risk factors like overjet and lip incompetence resulting into reduction of traumatic dental injuries.



Dental Trauma, Endodontics, Restorative Dentistry

## **MTA Pulpotomy and Putty Index Technique for Management of Complicated Crown Fractures in Young Permanent Incisors: A CASE Report**

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**Introduction:** Management Complicated crown fracture in a young permanent tooth with an open apex is indeed a challenge to the practitioner. A procedure that will maintain the vitality of the tooth, promote root development, followed by a definitive restoration that will not only restore the form of the tooth but also the confidence of the child is mandatory. This case report describes the successful rehabilitation of such a case with follow up

**Case report:** A 11 year old boy reported with fractured central incisors, the day after trauma. The left incisor showed a pin point exposure, while the right showed no evidence of exposure. Both had open apices. An MTA pulpotomy to promote apexogenesis was done on 21 and an alginate impression of the patient was made. A wax mockup of incisors to the desired form was achieved on the cast and a putty index was made. At the next appointment a composite restoration was done for both the incisors using this index.

**Discussion:** Success depends on the time at which treatment is initiated after trauma and the material used. Also, due to the inability to achieve isolation immediately post trauma; putty index technique comes handy, where a good form can be established for the tooth on the cast and the patient can be called later for rehabilitation when hemostasis and isolation can be achieved.

**Conclusion:** MTA pulpotomy followed by putty index technique for restoration is a good option for managing traumatized young permanent teeth with crown root fractures.

**Photobiomodulation as an Adjunctive Therapy in Management of Dental Trauma**

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**Introduction:** Dental trauma in children is a common and complex clinical event which poses a significant challenge to even the most competent pedodontists, as in addition to the management of associated injury and pain, it also causes detrimental psychological effects on the child. Recent advances such as photobiomodulation therapy proved to be beneficial due to its bio stimulating and anti-inflammatory effects. The following case report presents the advantage of using photobiomodulation as an adjunct in management of traumatic dental injury.

**Case report:** A 7 year old child reported to our department after suffering a kick from a horse on the right side of his face. Clinical examination revealed soft tissue injuries on the labial and palatal mucosa, luxation of 11, 52, 53 and missing 54. CT examination revealed a greenstick fracture on the right canine prominence. Flexible splinting was done for 4 weeks. Photobiomodulation therapy was done using 810nm diode laser. Patient reported marked reduction in pain and rapid healing.

**Discussion:** Photobiomodulation can serve as a better option in reducing pain, mobility teeth, resolving inflammation and acceleration of healing in dental traumatic injuries. However, only problem we encountered is frequent recall of the patient for Photobiomodulation therapy.

**Conclusion:** The present report showed excellent results in the management of dentoalveolar trauma with adjunctive photobiomodulation therapy. Hence, laser therapy can be a beneficial in terms of psychological approach and compliance of patient reducing discomfort due to pain and promoting rapid healing.

**Radiculogenesis: Regeneration of Pulp in A Nonvital Avulsed Tooth with Open Apex**

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**Introduction:** The management of the avulsed immature tooth poses a challenge for restoration of its vitality. The prolonged dry time results in unfavourable prognosis of either replacement resorption or ankylosis. The restoration of natural tissues provides best biological tissue architecture and aesthetics.

**Case Report:** An eight year old female reported to the department with avulsed permanent right central incisor. The tooth was in NOLLA's 8th stage and had extraoral dry time of two hours. The pulp was extirpated and tooth was implanted into the socket. Non-rigid splinting was done for 14 days and an intracanal proprietary polyantibiotic paste was placed and sealed with biodentine. After one year follow up, the regenerated apex of the root resembled the normal anatomy with no discolouration. Angiography suggested the formation of vital tissue. After one-and-half years, the tooth was extracted due to crown root fracture. On histologic examination, the regeneration of pulpal tissue was evident in radicular area with continuation of root dentin formation.

**Discussion:** Maturogenesis results in repair by formation of fibrous pulp-like tissue and apex closure by revascularisation tech and placement of PRF with MTA. In the present case, regeneration of the pulp with anatomical root formation was confirmed histologically with the placement of medicament in the first sitting. This regeneration of dental pulp and hard tissue in immature non-vital avulsed tooth is coined as "Radiculogenesis".

**Conclusion:** This is an innovative technique for the management of an avulsed non-vital tooth with immature roots.

## Dental Trauma

**Emergency Management of Dental Avulsion: Attitude, Knowledge and Perception of Mothers**

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**Background:** Dental trauma is a frequent occurrence in childhood. Lack of awareness and knowledge among parents results in delayed presentation in the dental clinic leading to unfavorable long-term prognosis.

**Method:** A questionnaire consisting of ten questions was used to interview 60 mothers who participated in this study in rural areas of modinagar (U.P) India. The variables comprised socio-demographic information, and questions about their knowledge and attitude toward avulsed tooth. Each question was provided with options which maybe correct or incorrect answers. Participants were requested to mark the option which they perceive as the most appropriate answer.

**Results:** The overall awareness amongst parents is 31.56% showing lack of necessary information regarding the preservation and management of avulsed tooth.

**Conclusions:** These data reinforce the need to provide the population with some important information regarding the emergency management of avulsed tooth.

### **Crown Fragment Reattachment in Anterior Fractured Teeth**

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**Introduction:** Crown fractured are the most frequent traumatic dental injuries in children. Reattachment of the fractured fragments can be attempted in cases which the coronal segment is available and there is no or minimal violation of biological width.

**Case report:** Eight patients ( two girls and six boys ) aged between 8-11 years were referred to the Istanbul University Faculty of Dentistry Department of Pediatric Dentistry. The patients had coronal fractures in their maxillary incisor teeth and all had the fractured incisal fragments. Four of these teeth were stored in milk, one of these were stored in water and three of these teeth were stored dry. The fractured tooth fragments stored in serum physiologic for rehydration. In incisal fragments internal dentin groove was prepared with high speed burs. The fractured surfaces were etched with %37 phosphoric acid then rinsed, dried and applied bonding agent without light curing. Composite resin was applied to the fragments and the tooth surfaces. Then the fractured segments were accurately placed on the teeth. When the original position had been re-established, excess resin was removed, and they were light cured for 40 seconds. The teeth were finished and polished with finishing instruments and polishing discs. Clinical and radiographic follow-ups were regularly over a year.

**Discussion:** The reattachment of a crown fragment seems to be a practical alternative to placement of conventional composite resin restorations in the management of fractured anterior teeth, as this method is simple, conservative, and provides satisfactory fragment retention and esthetics. It also ensures complete restitution of the tooth's integrity.

**Conclusion:** Reattachment of fractured tooth fragments can provide good and long-lasting esthetics because the tooth's original form can be maintained. Chair time for the completion of the restoration is minimal. It is important the inform the public about storage conditions of fractured fragments.

## Dental Trauma

**Knowledge, Attitude & Practice of School Teachers towards Dental Avulsion of Tooth**

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Maharashtra, India*

**Background:** School teachers can play an important role in improving the Prognosis of avulsed permanent teeth of school children after they are informed about the immediate and proper dental first aid steps to be taken at the time of an accident.

The aims of this study were to assess the knowledge level of emergency measures for tooth avulsion in children.

**Methods:** Seventy teachers of primary and intermediate schools in Maharashtra state of India were interviewed using a questionnaire about their first-aid knowledge with particular focus on the following five categories:

General knowledge of teeth and avulsion,

Replantation of primary and permanent teeth

How to clean an avulsed tooth before replantation

Extra-oral time and storage methods and media for an avulsed tooth.

Increasing the awareness of dental trauma management among the school teachers may be one of the ways to improve the prognosis of avulsed teeth.

**Results:** A simple survey can be a valuable tool to convey important basic information and enhance knowledge of tooth avulsion and guide on how school should act in such a situation, although there are limitations in conveying the message for a complete understanding.

**Conclusions:** knowledge among school teachers was found to be low regarding emergency care to be taken for an avulsed tooth at school However, a simple survey can convey important basic information to school teachers and substantially raise the knowledge level.

**Pediatric Dentists' Knowledge Regarding Traumatic Dental Injuries in Primary Teeth in Brasília, Brazil.**

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**Background:** The proper management of traumatic dental injuries (TDI) in primary teeth has an important role to prevent sequelae in primary and permanent dentition. Despite the relevance of this management, there is a lack of information by professionals and the general population. This study aimed to evaluate the level of pediatric dentists' knowledge regarding TDI in primary teeth.

**Methods:** A questionnaire with 22 objective questions was applied to pediatric dentists in Brasília, Brazil. The first part of the questionnaire contained questions to describe the professional's profile and the second part question to assess the knowledge about the treatment approach of TDI in primary teeth. The data were tabulated in an Excel spreadsheet. Descriptive statistics and chi-square tests were used for statistical analysis. An alpha level of less than 0.05 was considered statistically significant.

**Results:** Thirty-three pediatric dentists answered the questionnaire. The participants were in the age range of 25 to 55 years. The majority were female (93.90%) and graduated more than 10 years ago (75.80%). Most specialists worked in private practice (63.50%) and had Pediatric as a specialization course (78.80%). Approximately 86.70% of the questions had more than 50% of the correct answers. Regarding the management of replantation avulsed primary tooth, there was a statically significant difference between participants (p 0.001). For this question, the more years since graduation, more answers that are correct were obtained.

**Conclusions:** Pediatric dentists demonstrated a satisfactory level of knowledge of TDI; however, they need to update themselves periodically regardless of time after graduation.

**Dental Trauma: A Clinical Challenge**

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**Introduction:** Epidemiology of dental trauma shows most affected teeth are incisors, with peak age of 2-3 years and 7-11 years, with sex predilection for males. There might be slight variation these trends in globally. The loss of primary still lives with hope of eruption permanent teeth to child and parent. However, managing traumatic permanent teeth is major challenge to a pedodontist.

**Case Report:** A 13 year old girl reported to dental institute with trauma to upper anterior due to history of fall intraoral findings revealed Avulsion of 11 and Intrusion of 21. Percussion test showed metallic sound with 21 teeth. Radiographic findings showed empty socket in relation to 11, PDL space of 21 is obscure and CEJ moved apically. Also, we observed 3-4 mm mucocele on lower lip. After required clinical, radiological investigations, surgical repositioning of intruded 21, followed by splinting was considered. After a week EPT showed non-vital 21 and no pain or tenderness. Following which RCT opening was done and splinting was almost removed 2 months later. Impressions were made and functional removal was considered to restore functionally 11. As the mucocele was one more finding, hence surgical excision was done, which was histopathologically confirmed as extravasations type.

**Discussion:** A course of treatment plan and outcome of a dental trauma depending proper history, clinical and radiological assessments. However, in present case decision of surgical vs orthodontic repositioning of teeth was well evaluated.

**Conclusion:** A compressive dental treatment should be considered following any dental trauma to restore the functions.



### Unusual case of Traumatic Intrusion in Immature Permanent Incisor

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**Introduction:** Intrusive luxation is a complicated traumatic injury associated with severe damage to the support periodontal and pulp tissues. The treatment of this condition should be individual, considering the severity of the intrusion and the stage of root development.

**Case Report:** This case report describes the treatment of a 6-year-old boy who suffered intrusive luxation of tooth 11. Radiographically, the diagnosis was confirmed. Soon, considering that root formation was incomplete, the treatment was waiting for re-eruption and radiographic monitoring. In one of the follow-up appointments, the gingival area of the tooth a was redness suggesting the diagnosis of a periodontal abscess. However radiographically, radiolucency was observed near the apex of the tooth. The child was referred to an endodontist, who requested a tomography. The image of the tomography showed that the previously observed radiolucent area corresponded to a root fracture (not possible to see in the periapical radiography), therefore, it was still decided to wait for the re-eruption. After two months, the tooth re-erupted.

**Discussion:** The literature shows the need of reducing the number of radiographs for accurate diagnosis due to radiation-associated risks. However, this reduction cannot compromise the treatment, since sometimes conventional radiography is not sufficient to determine the correct diagnosis and computed tomography should be indicated. Computed tomography provides better visualization of traumatized tooth particularly in cases of root fractures.

**Conclusion:** In this case, computed tomography was particularly important for changing the course of injury treatment. In addition, professional experience and multidisciplinary care were essential for successful treatment.

### Factors that Affect the Survival of Primary Teeth after Intrusive Luxation: Retrospective Longitudinal Study

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**Background:** Intrusive luxation is a frequent type of traumatic dental injury in the primary dentition. The purpose of this study was to evaluate the survival of primary teeth after intrusive luxation and identify factors that contribute to the early loss of the intruded tooth.

**Methods:** A retrospective longitudinal study was conducted with 88 dental records of children with intrusive luxation at a reference clinic for traumatic dental injury in the primary dentition. Data analysis involved descriptive statistics and Cox regression ( $p < 0.05$ ; 95% CI).

**Results:** Among a total of 128 intruded teeth, 49.2% ( $n = 63$ ) had a mild degree of intrusion. The survival rate throughout the follow-up period was 65.6%. Age older than 3 years and 8 months (HR: 2.28; 95% CI: 1.04-4.99;  $p = 0.039$ ), development of inflammatory process (HR: 2.35; 95% CI: 1.17-4.71;  $p = 0.016$ ), the development of a periapical lesion (HR: 3.51; 95% CI: 1.39-8.85;  $p = 0.008$ ) and compromised germ of the permanent successor (HR: 4.38; 95% CI: 1.99-9.61;  $p < 0.001$ ) were factors associated with the indication for the extraction of primary teeth following intrusive luxation.

**Conclusions:** The survival of intruded primary teeth was lower among patients older than 3 years and 8 months, as well as those with an inflammatory process, periapical lesions, and a compromised germ of the permanent successor.

**Management of Avulsion and Lateral Luxation in Immature Permanent Teeth: A Case Report**

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**Introduction:** Childhood and adolescence are high-risk periods for dental injuries . Multiple dental injuries are often seen in high-velocity accidents or sport-related falls. These injuries can bring about serious damage to the tooth supporting structures and subsequent complications if inadequately treated. The current case highlights the complexity of the trauma that can occur and how prioritization of treatment allows favourable outcomes.

**Case Report:** A 10-year-old male reported to the department, 50 minutes later following a dental trauma, with a chief complaint of missing teeth in the upper front tooth region. Following clinical and radiographic examination, diagnosis of avulsion in relation to 11, 21 and lateral luxation in relation to 12, 22 was made. Replantation of 11, 21 and repositioning of 12, 22 were done, followed by a semi- rigid splinting extending from 13 to 23. Root canal treatment was initiated and calcium hydroxide dressing was done in 11, 21 at the 10th day post-trauma. The splint was removed after 4 weeks, and the patient is under regular follow-up.

**Discussion:** Important principles in managing dental trauma to ensure favourable outcomes include early repositioning and splinting of the traumatized teeth and prevention of infection. Early repositioning and stabilization have been shown to promote the best periodontal repair. Splinting technique allows physiologic movement of teeth and optimal healing of pulp tissues and periodontal ligaments.

**Conclusion:** Holistically planned immediate and appropriate management of dental trauma based on the recommendations of IADT guidelines can minimize possible complications.

**Management of the Immature Tooth with Necrotic Pulp in the Recurrent Traumatic Injuries**Gül Keskin, Zübeyde Uçar Gündoğar, Mehmet Çiloğlu*Pediatric Dentistry, Faculty of Dentistry, Gaziantep University, Gaziantep, Gaziantep, Turkey*

**Introduction:** Traumatic injuries of immature permanent teeth with necrotic pulps represent a challenge for endodontic treatment and are difficult candidates for conventional root canal fillings due to increased susceptibility to root fractures. Partial pulpotomy, apexogenesis, and revascularization are alternative regenerative endodontic procedures that could be beneficial to restore tooth vitality and reduce the risk of root fracture. The aim of the report is to present the endodontic treatment of an immature tooth with a complicated crown fracture and recurrent traumatic injuries.

**Case Report:** An 11-year-old male patient who experienced dental trauma 1 year ago presented to the Department of Pediatric Dentistry at the Faculty of Dentistry of Gaziantep University. A fistula on the buccal surface and the periapical lesion related to a complicated crown fracture of the immature maxillary left incisor tooth were recorded following clinical and radiographic examinations. A regenerative endodontic procedure was performed on the tooth; and it became asymptomatic on follow-up. 8 months after the initial treatment, an apical plug with mineral trioxide aggregate (MTA) was applied because a periapical abscess had developed due to secondary trauma. Successful management was demonstrated at the six-month follow-up.

**Discussion:** An apical plug with MTA and regenerative endodontic procedures were effective alternatives for strengthening the roots and accomplishing apexogenesis of open apices in a case involving a traumatized tooth with recurrent trauma.

**Conclusion:** The present report demonstrated success of regenerative treatment and MTA plug application for a traumatized immature tooth.

## Dental Trauma

**The Perception of High School Hockey Players and their Coaches regarding Various Types of Mouth Guards Available in South Africa**

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**Background:** Dental trauma can have negative lifetime consequences. It can be largely prevented by using mouth guards during organized sports and recreational activities. Generally, compliance with mouth guards is poor and the type of mouth guard used seems to influence the compliance. Although a lab study was conducted to determine the differences between the various mouth guards available on the South African market, it was not supported qualitatively by athletes' perceptions. Moreover, coaches seem to influence athletes' use of mouth guards. Coaches should also be able to manage traumatic injuries that occur during organized sports.

**Methods:** Mixed quantitative and qualitative methods were used in this study. A high school hockey team and their coaches were the subjects of this study. First, a questionnaire was completed by the athletes regarding their previous experience with mouth guards. Thereafter, various types of mouth guards were distributed before every training session to assess the perception of athletes towards each type. The questionnaire was completed by each athlete after the use of each type of mouth guard. Coaches were required to complete a questionnaire regarding their knowledge of mouth guards and the management of acute dental trauma.

**Results:** The use of mouth guards were influenced by previous history of dental trauma as well as the coaches' attitude and preference. Mouth guards were not used by athletes during training sessions and recreational activities. Also, mouth guards were neither recommended by coaches in those activities nor made compulsory in order to participate in matches. Furthermore, coaches were not competent in managing dental trauma. The perception of stock and boil-and-bite mouth guards were generally poor. Custom made mouth guards were associated with better perception and compliance. Pressure laminate mouth guards were perceived to offer the best comfort and protection.

**Conclusions:** Only custom made mouth guards should be recommended for use in organized sporting activities. As the knowledge of coaches regarding mouth guards and management of acute dental trauma is deficient, programmes and information sessions should be offered to address this gap in knowledge.

## Remote Interdisciplinary Shared Management of A Severely Intruded Immature Incisor Close to the Nasal Cavity During COVID-19 Pandemic

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**Introduction:** An 8 years old healthy female presented with a deviated nasal septum and a missing UL1, after a trampoline accident. Further investigations revealed UL1 was actually severely intruded. We provided shared care through remote consultation with OMFS, ENT and the local dentist. Number of hospital visits was reduced, suiting the family.

**Case Report:** Concerns on initially presentation to OMFS were a deviated nasal septum and a missing tooth. We recommended a CBCT after assessing a DPT radiograph. This revealed the apex was close to the nasal epithelium. We advised the need to surgically reposition UL1 and how to splint remotely. Care was transferred to us via email on discharge.

At 1 week post injury sensibility testing and baseline radiographs revealed the tooth was vital. A telephone review prior to visit was conducted and preparatory materials were emailed. After discussion amongst consultants, it was agreed to not to extirpate UL1. Subsequently remote review has been conducted via telephone consultation, receiving clinical photographs via email by the family, digital radiographs review by the local Dentist. Splint was removed 4 weeks after injury.

**Discussion:** COVID-19 has led to evolution of a trauma patient pathway that facilitates remote shared care with colleagues in primary and secondary setting. The mother was appreciative of preparatory materials, having radiographs locally and less hospital visits. The upper incisors have remained asymptomatic.

**Conclusion:** Reducing trauma and exposure to the virus is important during the pandemic. Remote shared care works between dental providers is now part of our trauma patient pathway.

**Rehabilitation of a Patient with Dento-Alveolar Fracture in the Mandibular Anterior Zone due to Trauma**

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**Introduction:** Traumatic dental injuries occur most frequently in children and young adults. Proper diagnosis, treatment planning and follow up are very important to assure a favorable outcome.

**Case Report:** An 11-year-old female patient administered to our clinic with the history of trauma. Her family reported that the patient fell when she was biking and hit her chin on the sidewalk yesterday evening. At the emergency room an oral surgeon reduced the fracture and immobilized it with a suture. Clinical and radiographic examination, showed that alveolar process fracture including three teeth at mandible(42,41,31) and also uncomplicated enamel-dentin fracture at teeth 11, 21, 41, and 42. After anesthetic injection, the suture was removed, and replaced with a semi-rigid fiber splint. Esthetic restorations of 11 and 21 were completed. A week later root canal treatment using calcium hydroxide was started for 42, 41, and 31. After 4 weeks teeth were asymptomatic and periodontal tissues were healed. Endodontic treatment of 42, 41, and 31 was completed and fiber splint was removed. In 15-months follow-up, the teeth were asymptomatic and the line of fracture was clinically and radiographically normal. The patient said that she was satisfied with the aesthetics and function of the teeth.

**Discussion:** Damage occur in dentoalveolar injuries can vary depending on the severity of the trauma, the elasticity/shaped/direction of arrival of the impacting body, the extent of the lips and other soft tissues, and the position of the teeth and jaws.

**Conclusion:** In traumatic dentoalveolar injuries, the affected teeth can be successfully treated with the right treatment approach and cooperation established with the patient and parents.

**Decoronation Treatment of Pediatric Patients with Special Health Care Needs**

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**Introduction:** The special health care needs include any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity.

Health care for individuals with special needs requires specialized knowledge, in many cases, without the need for sedation or general anesthesia.

In these patients the risk of dentoalveolar trauma is high with various consequences for permanent dentition

**Case Report:** An 11-year-old boy with special health care needs who had a complicated crown fracture of his two permanent upper incisors (1.1 and 2.1). Endodontic treatment of 1.1 and decoronation of 2.1 were performed with a provisional in cantilever. This treatment was performed under laryngeal mask.

**Discussion:** The decoronation of a resorbing anterior tooth will allow it to serve as a matrix for alveolar bone formation and preserve an otherwise resorbing alveolar process, thereby leaving an environment of bone and soft tissue that is optimal for both single implant insertion or fixed prosthesis. Finally, decoronation, if indicated, appears to be cost-effective in comparison with non-replantation combined with subsequent repeated prosthetic tooth replacements owing to vertical alveolar growth of adjacent ridge areas.

**Conclusion:** Good management of dental trauma in special health care need patients can be performed in all patients with a good multidisciplinary team.



**Surgical Management of Inverted Impacted Incisors in 10 year old patient: A Case Report**

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**Introduction:** Traumatic injury to primary teeth occurs with high frequency during initial growth period as motor coordination is not well-developed. Intrusive injuries account for 4 to 22% of damage to primary teeth and are related to developmental phase of permanent tooth germ. Dilaceration refers to an angulation or sharp bend in the root or crown of a formed tooth representing 3% of developing tooth injuries.

**Case Report:** A 10 years old male patient reported with a chief complaint of missing a tooth in the upper left region revealing a history of trauma at 3 years of age. Intraorally, the crown of the unerupted left central incisor was palpable as a labial bulge in the vestibular sulcus. IOPA and panoramic radiograph demonstrated an impacted central incisor with the lingual surface of crown directed labially and root dilaceration at cementoenamel junction.

Mucoperiosteal flap was elevated on the labial side with adequate bone cutting to expose the crown completely. The tooth was sectioned and extracted followed by curettage and sutures. After one week, sutures were removed and Removable Partial Denture was given for esthetic and psychosocial reasons.

**Discussion:** Orthodontic traction and repositioning was not possible because of acute bend of the root, hence extraction was preferred to prevent unfavorable sequelae of unerupted tooth followed by partial denture placement.

**Conclusion:** The present report showed that the surgical extraction modality may be serve as an option of treating difficult impacted incisors in growing patients.

## Dental Trauma

**A Comparison of Cosmetic Outcomes of Absorbable Vs Non-absorbable Sutures in Pediatric Facial Wounds**

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**Background:** There is a longstanding disagreement among surgeons as to the ideal suture material for closing skin wounds of the face. Most surgeons believe that non-absorbable suture material is preferable, as it elicits a minimal inflammatory response. Other prefer absorbable sutures because they do not have to be removed, thus decreasing a patient's anxiety and discomfort especially in younger apprehensive children. The present study was done to compare the cosmetic outcomes of absorbable versus non-absorbable sutures in pediatric facial wounds.

**Methods:** Healthy children in the age group of 1-15 years presenting with facial lacerations were divided into two groups: group A and group B. Lacerations of group A children were sutured with 5-0 vicryl and group B with 5-0 nylon suture material using interrupted suturing technique. The patients were followed in the department for wound care and photographs of the wound were taken on the day of suture removal and three months after suture removal by using a standardized digital camera. The photographs were assessed for scar formation using VAS.

**Results:** Of the total twenty patients in both the groups, there were no significant differences in the mean VAS scores of group A and group B on the day of suture removal and three months after suture removal. Also, there were no significant differences in the rates of wound infection and wound dehiscence.

**Conclusion:** The use of absorbable vicryl suture is a viable alternative to non-absorbable suture nylon in the repair of pediatric facial wounds.

**Revascularization of Immature Permanent Teeth: 2 Case Reports**

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**Introduction:** In young permanent teeth the ideal treatment for thickening of the dentin walls and increasing root development would be to stimulate the regeneration of a functional pulp-dentin complex. The purpose of this case report is to follow up regeneration therapy as today's treatment approach.

**Case Report:** In the first case, a 8.5-year-old male patient was admitted to our clinic with pain and percussion sensitivity 6 months after the restoration of the uncomplicated crown fracture in the upper right central incisor tooth with composite. In the second case; A 10-year-old girl patient presented to our clinic with deep dentin caries and pain in the lower right second premolar tooth. In both cases, regeneration therapy was planned and applied since the teeth had not completed its development and apical opening was present. It was observed that both teeth were asymptomatic and the root development was completed during the 18-month clinical and radiological follow-ups.

**Discussion:** Regeneration therapy has the advantages of being technically simpler than the traditional apexification treatment in pulp which has necrosis due to trauma or caries, and that the new tissue source created in the root canal system is one's own blood cells. The disadvantages are that the discoloration and root canal obliteration of the tooth and the regenerated tissue, which its source has not been determined due to the application of topical antibiotics.

**Conclusion:** According to the results obtained in case reports, revascularization treatment is thought to be an alternative to conventional apexification treatment for immature teeth.

## Current Splinting Techniques for the Traumatized Tooth: A Review

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**Background:** Traumatic dental injuries are a common presentation in the paediatric dental patient and injuries where displacement has occurred, for example luxation and avulsions as well as displaced root fractures will require stabilization once repositioned. Although splinting is rarely justified in the primary dentition it may be utilized in individual cases. The range of splinting techniques are available to the paediatric dentist and consideration of these is necessary to inform treatment options.

**Literature Review:** Splinting choices include rigid and flexible options. Rigid splinting with arch bars, wire ligatures or heavy orthodontic wire has been shown to promote pulp necrosis and periodontal ligament (PDL) damage with resulting ankylosis and replacement resorption. Therefore, non-rigid, physiological splinting is accepted as the gold standard. Wire and composite splints are cost-effective and widely available to the general practitioner. Care must be taken to use a flexible wire (no larger than 0.4mm). Similarly, orthodontic brackets and wire may be beneficial. Fibre splints cemented with composite resin have also shown favourable outcomes. The titanium trauma splint (TTS) is a 0.2mm thick, flexible splint, which is easily adapted to the arch contour. It has a rhomboid structure, allowing cementation using flowable composite. The TTS has been compared favourably with alternative flexible splints in the literature and has the benefit of reduced chairside time. Its disadvantage however is increased cost. Composite splints are rigid and prone to fracture and are not to be recommended.

**Conclusions:** Physiological splinting is essential to reduce PDL injury and therefore improve long term outcomes in the growing patient.

## Recurrent Trauma and Follow-up Affecting Upper Maxillary Teeth in a Child with Cerebral Palsy: A Case Report

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**Introduction:** Cerebral palsy (CP) is characterized by motor dysfunctions that may be associated with sensory or cognitive impairment stemming from a non-progressive brain lesion. Individuals with CP have a high risk of dental trauma because of their typical Class II malocclusion.

**Case report:** A 10-year-old girl patient with CP, presented to our clinic as a result of trauma in the maxillary central teeth (#11 and #21) after falling. It was observed that a complicated crown fracture was in #11 and an enamel-dentine fracture in #21, close to the pulp. Cvek pulpotomy was applied to #21 with white MTA while root-canal treatment was applied for #11 that has completed root development. It was observed that teeth were healthy in their 3-month and 1-year follow-up. In a 18-month follow-up as a result of recurrence of the trauma it was observed that both restorations were broken. #11 was healthy while #21 had periapical lesions. Following the root-canal treatment applied to #21, both restorations were renewed. However, while it was observed that the teeth that were controlled with the repetition of the trauma within 1-year were observed to be periapically healthy, the restorations with impaired margins were renewed.

**Discussion:** Studies have shown that patients with CP have a higher risk of dental trauma than healthy individuals, although their physical activity is limited.

**Conclusion:** Individuals responsible for the care of patients with CP should be aware of the dental trauma risk in terms of oral health and be careful.

**“Honey – An Elixir for Avulsed Teeth”**

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**Background:** Replantation is the treatment of choice for avulsed teeth, but its prognosis depends on various factors. Periodontal ligament (PDL) cells play an important role in the healing process of replanted teeth. Various storage media have been investigated to maintain the viability of these cells. Honey has several properties fulfilling most of the ideal requirements of a storage media for avulsed teeth, but has not been assessed enough in literature. Thus, the aim of this study was to evaluate the viability of human PDL cells in honey when used as a storage media, at different time intervals.

**Methods:** 35 freshly extracted premolars were divided into 4 groups as follows: I – no media (negative control), II – placed in honey 30 minutes post-extraction, III- placed immediately in honey post-extraction, IV – placed in HBSS (positive control). MTT assay analyzed the cell viability at 3 and 6 hours. The data obtained was statistically analyzed and results obtained.

**Results:** At 3 and 6 hours, Group III and IV showed no statistically significant difference, at p

**Conclusions:** Within limitations of this study, honey proved to be as efficient as HBSS after 3 and 6 hours of storage, if the tooth was placed immediately in both the media respectively. Hence, honey can be used as a short-term storage medium, up to 3 hours, for an avulsed tooth with an extra-oral time of 30 minutes.

**COVID-19: Impact on Traumatic Dental Injury Attendances to a Paediatric Emergency Department in the UK**

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**Background:** Emergency departments in the UK saw decreased attendances in the months following the announcement of the COVID-19 [GL1] global pandemic in March 2020. The UK entered 'lockdown' and primary dental care services were restricted to emergency treatment provision.

**Methods:** A service evaluation was conducted of attendances to a paediatric emergency department (PED) with traumatic dental injuries (TDIs) during the COVID-19 affected months March-April 2020 compared to the same timeframe in 2019, via retrospective review of digital patient records.

**Results:** For all dental attendances, a decrease was observed from n=74 in 2019 to n=58 in 2020. However, the number and the proportion of TDIs relative to all dental attendances increased from 24% (n=18) in 2019 to 41% (n=24) in 2020 respectively. The number of weekday out-of-hours attendances increased by over two-fold from n=3 in 2019, n=6 in 2020, with similar numbers of weekday attendances. Compared to 2019, more children were referred to the on-call dentist but none required admission in 2020. Twice as many children aged 7-16 years old presented with TDI in 2020. For children under six-years-old, TDI was the primary complaint for 31% (n=18) of all dental attendances, increasing from 20% in 2019.

**Conclusion:** During the COVID-19 pandemic and lockdown an increased number of children presented to a UK PED with TDIs despite an overall decrease in dental attendances. Increased time and physical activities at home following school closures in addition to limited access to primary dental care services may have contributed to increased TDI attendances to the PED.

## Dental Trauma

**Use of Mouth Guards and Prevalence of Dental Trauma in Children and Adolescents doing Amateur Boxing**

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**Background:** There are many things that Academics cannot teach students. Sports are essential for the overall health and wellbeing of an individual. But at the same time, it is very important to protect our body from sports injuries. Mouth guards are used mainly by Amateur Boxers for providing protection against oro-facial injuries. It functions by equally distributing the stress on impact to the underlying bones and teeth.

**Methods:** A computerized survey was conducted with the help of Google forms to assess the Prevalence of dental trauma and the use of mouth guards, its pros and cons in amateur boxers in the age group of 7-18 years. the study was conducted in Thrissur district in 101 students. Data were analyzed.

**Results:** Out of 101 students, 94 aware that they should use a mouth guard. 62.5% found it expensive and 59.1% found it difficult to wear.

**Conclusions:** Despite the protection provided by mouth guards, many amateur boxers are still reluctant to use those citing reasons such as discomfort on wearing, reduced ability to breath and also lower performance levels due to fatiguing of the oro-facial musculature. These challenges can be overcome by a better understanding of the neuromuscular philosophy. Neuromuscular dentistry mouth guards register the occlusion in the most relaxed position thereby improve overall performance levels and concentration in boxers. One important aspect of Dentists' responsibility is to act as an advocate with the local athletic association, schools etc. Thereby making sports a trauma free and beautiful event.



## Dental Trauma

**Dental Trauma Experience among Some Public Primary and Secondary School Pupils in Ibadan, Nigeria**

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**Background:** Dental trauma is a public health problem, accounting for 17% of injuries to the body in those below the age of 6 years compared to an average of 5% across all ages. It is more rampant among very young people. The prevalence in Nigeria is increasing. A prevalence of 10.8% was reported in Ibadan about a decade ago. The current study is therefore aimed at finding the prevalence of dental trauma in Ibadan.

**Methods:** This was a cross-sectional study carried out among children aged 7 - 15 years in public schools in Ibadan North Local Government Area of Oyo State, Nigeria. Three primary and three secondary schools were selected. An interviewer-administered proforma was used to obtain information. Factors assessed were some predisposing factors of dental trauma, among which are Angel's Class II division 1 malocclusion, increased over-jet, anterior open bite and lip competence. Data was analyzed using SPSS version 21 and the level of significance was set at p0.05.

**Results:** Two hundred and thirty-five children participated in the study. There were 114 (48.5%) males and 121 (51.5%) females. Prevalence of dental trauma was 11.1%. Assessed factors that were statistically significant were gender ( $p = 0.05$ ) and age ( $p = 0.02$ ). Commonest dental trauma was Ellis class I while the most affected teeth were the two upper central incisors.

**Conclusions:** Gender and age have statistically significant effects on dental trauma among school children. Teeth most commonly affected by dental trauma are the upper central incisors. The commonest dental trauma was Ellis class I.

**MTA Cvek Pulpotomy: Case Report and Literature Review**

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**Introduction:** The Cvek pulpotomy is a technique used in complicated crown fractures in permanent teeth. It includes the removal of 1-3 mm of the coronal pulp located around the pulp exposure. The purpose of the report is to present a case of a complicated crown fracture in a young permanent central incisor and its conservative management that safeguards the development of the tooth and improves the quality of life of the patient.

**Case report:** A 12-year-old patient attended the Pediatric Dentistry Postgraduate Department at the “UPCH” indicating sensitivity after dental trauma. The oral exam revealed a significant crown fracture of the upper right central incisor with pulp exposure. A Cvek pulpotomy was performed on incisor 11. The bleeding was easily controlled at the entrance of the radicular pulp with a cotton pellet and a layer of MTA Angelus® was placed. The tooth was immediately reconstructed with a composite resin. Clinical and radiographic controls at 1, 2, 10 and 16 months showed good healing through a non-pathologic process, and no evidence of apical or periodontal infection.

**Discussion:** Complicated crown fractures can easily evolve into pulp necrosis, causing an alteration in the root development. The Cvek pulpotomy with MTA helps the development of a dentinal bridge and allows an apical closure and the thickening of the dentine walls in order to prevent a future root fracture.

**Conclusion:** In this case, a partial pulpotomy with MTA showed clinical and radiographic success after 16 months, proving to be an excellent conservative alternative for the treatment of complicated crown fractures in young permanent teeth.

**Prosthetic Rehabilitation of a Child with Rubinstein Taybi Syndrome after Dental Trauma: A Case Report**

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**Introduction:** Rubinstein Taybi Syndrome (RTS) has a genetic origin on chromosome 16 and has physical characteristics, physical and mental development delay, and may present with oral alterations. The objective of this paper is to report a case of prosthetic rehabilitation of a patient with the syndrome who, due to dental trauma, lost teeth.

**Case Report:** Female patient, aged 4 years and 7 months, with RTS. After the dental trauma, she lost the upper central incisors (5.1; 6.1). The data collection procedure was carried out through careful clinical and complementary exams. After the diagnosis and establishment of the treatment plan, we chose to make a Denari's prosthesis. It has a tube-bar mechanism that allows maxillary growth and development and does not require minimal preparation on the teeth for its cementation. The patient's parent was instructed to have an appointment with a speech therapist, as well as periodic visits to the dentist for clinical follow-up.

**Discussion:** The loss of anterior deciduous teeth may be associated with trauma to the anterior region. Dental absence can affect the development and behavior of children, promoting a change in daily routine and impacting the quality of life of the whole family. The Denari's prosthesis is a viable treatment option, as it accommodates the child's maxillary growth.

**Conclusion:** The early loss of primary teeth is still a problem in pediatric dentistry. The child's oral rehabilitation with the aesthetic-functional Denari appliance, provided restoration of the functions of the stomatognathic system, corrected deleterious habits and helped with phonetics.

## Management of Inflammatory External Root Resorption in Previously Reimplanted Avulsed Teeth: A Three-Year Follow Up

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**Introduction:** Inflammatory external root resorption (IERR) is a serious complication following reimplantation of avulsed teeth. This case report presents successful management of IERR in previously reimplanted avulsed mature anterior teeth where endodontic therapy was not performed as per the International Association of Dental Traumatology (IADT) guidelines.

**Case Report:** A 9Y 2M female reported with pain and mobility in 11 and 21. Patient's history revealed avulsion of both the incisors and subsequent reimplantation and stabilization using a rigid metallic-wire splint by a general dentist four months back. The extra-oral time was approximately sixty minutes, dry storage for thirty minutes followed by storage in milk for thirty minutes. Teeth were not treated endodontically. Clinical examination revealed Ellis Class II fracture in 11, Ellis Class I fracture in 21 and grade I mobility, tenderness on percussion, negative pulp testing in both. Radiographic examination showed external root resorption in both the teeth. Endodontic treatment was initiated, canals were disinfected and obturated with MTA. Patient has remained asymptomatic with no progress in the IERR in both the teeth during follow-up of three years.

**Discussion:** Pulpal infection is shown to accelerate progression of IERR. Initiation of endodontic therapy and placement of calcium hydroxide within 7-10 days of reimplanting mature teeth is critical. MTA can deactivate the inflammatory process, retarding the odontoclastic/osteoclastic activity in IERR.

**Conclusion:** IERR in reimplanted avulsed teeth can be successfully treated with complete obturation with MTA. Failure to follow the IADT guidelines may increase the probability of unsuccessful outcome in reimplanted teeth.

**Endodontic Regenerative Therapy following Immature Tooth Delayed Replantation: Case Report**

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**Introduction:** Exarticulation or avulsion is a dental trauma characterized by the displacement of the tooth completely out of the alveolar socket and is treated by replantation. The aim of this report is to present a clinical case of a child that received endodontic regenerative therapy for treatment of a delayed replanted immature tooth.

**Case report:** An 8-year-old girl attended the Dental Trauma Care Service at the School of Dentistry of Ribeirão Preto at University of São Paulo in Brazil. Medical and Dental History, clinical and radiographic examination were taken 24 hours after the dental trauma and revealed the total exarticulation of tooth 21. The alveolar socket was irrigated with saline solution, the tooth was replanted, and sutures were done for the gingival lacerations. A flexible splint was applied and maintained for 4 weeks. Endodontic treatment was started with a calcium hydroxide-based canal dressing at the first session, followed by intra-canal blood clot induction at the second session, where the clot was covered with calcium silicate cement. No sign of infection or periapical radiolucency was found in tomographic or radiographic follow-up visits for up to 4 years.

**Discussion:** The success of root canal treatment via endodontic regenerative therapy performed by means of a blood clot induction, is characterized by absence of painful symptoms, edema or fistula, a decrease in apical radiolucency and a negative response to the pulp sensitivity test.

**Conclusion:** Endodontic regenerative therapy is an alternative to conventional endodontic treatment for delayed immature tooth replantation.

**Management of Complicated Crown Root Fracture by Reconstruction: A Case Report**

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**Introduction:** Trauma resulting in crown-root fracture is one of the most challenging fracture types. However, biologic width involvement should be carefully evaluated. Reattachment of tooth fragment to a fractured tooth remains as the treatment of choice because of its simplicity, natural esthetics, and conservation of tooth structure.

**Case report:** A 10-year old male patient came to the Department of Pediatric and Preventive Dentistry with the chief complaint of a fractured tooth in anterior maxilla that occurred one month ago. Clinical and radiographical examination revealed an unusual oblique complicated crown root fracture of 21. Endodontic treatment followed by restoration of the tooth extra orally was done, followed by replantation of the tooth (21). Seven months clinical and radiographical follow-up showed an asymptomatic tooth and gingival reattachment in the area of the fracture.

**Discussion:** Management of complicated crown-root fractures remains a challenge which is dictated by the extension of tooth fracture. Reconstruction and replantation of complicated crown-root fractured tooth reconstructed with resin bonding, has emerged as a new promising method in recent years.

**Conclusion:** Successful management of complicated crown-root fractured tooth has satisfying esthetics and excellent function with no sign of resorption or ankylosis.

## Dental Trauma

**Dental Trauma in Children: Survey of the Emergency Department at the Dental Consultation and Treatment Center in Casablanca**

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**Background:** Dental trauma is a common emergency in children and can cause various types of injuries. All the published studies agree on the importance of trauma in the assessment of the child's oral health.

The aim of this survey was to evaluate the frequency and the severity of dental trauma in children in the emergency department at the dental consultation and treatment center in Casablanca, and to determine the management of practitioners in the face of such emergencies.

**Methods:** This descriptive cross-sectional epidemiological survey was conducted in children between the ages of 6 months and 15 years over a period of 3 months, through a questionnaire containing 4 parts which was completed by the interviewer.

**Results:** 18.1% of consulted children in the emergency department had dental trauma, the age group of 9 - 12 years was the most affected. The sex ratio was higher in males at 71.8%. Falls represented the greatest percentage of trauma etiology (59.5%), and patients who consulted the same day of the onset of the trauma were in the order of 36.6%

Coronary fractures were the most frequent type of trauma (32.9%) and the restoration treatment represented 25.1%. Besides the delay in consultation which can be detrimental to the healing of the affected teeth, we can note the possible lack of emergency management in practice.

**Conclusion:** Dental trauma is a real public health problem in Casablanca, with variable consequences, particularly from a functional and aesthetic point of view, requiring immediate consultation and care

### Conservative Management of Horizontal Root Fracture: A Case Series

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**Introduction:** Root fractures are generally defined as fractures involving dentin, cementum, pulp, and periodontal ligaments. Compared to incidence of other types of dental trauma, root fractures are relatively rare with frequency of 0.5-7% in permanent teeth. When the coronal fragment is displaced, conservative treatment is repositioning of the tooth and rigid stabilization for 2–3 months.

**Case Report:** The aim of this case series is to present conservative management of three different patients with horizontal root fracture of permanent incisors. Out of these two cases (one immature permanent central incisor and the second one a mature permanent central incisor) with a middle third horizontal root fracture, were treated conservatively with rigid splinting for 8 weeks and remained asymptomatic over a period of 5 years. The third case presented with a symptomatic mandibular incisor and diagnosed with apical third root fracture after 2 weeks of trauma; It was managed conservatively with disinfection and obturation of the coronal segment only and remained asymptomatic over a period of 3 years.

**Discussion:** The first step in the treatment of horizontal root-fracture cases is accurate and early diagnosis. Conservative treatment should be preferred and immediate immobilization within 1 hour following the trauma gives the best results.

**Conclusion:** These cases show the favorable results of using a conservative approach exhibiting hard tissue healing, and maintenance of pulp vitality. These findings will contribute to the sparse literature on the topic and contribute to evidence-based management of traumatic injuries.



**The Dental Management of a Severe Intrusion Injury with Delayed Presentation: A Clinical Case Report**

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**Introduction:** Dental injuries in children are common but severe and complex injuries less so. Avulsion and severe intrusion injuries have poorer outcomes with detrimental long-term impact for children. Management of such cases is therefore important to enable the best long-term outcome.

**Case Report:** A 9-year-old boy sustained a concurrent avulsion and 10mm intrusion of central incisors. He presented to A+E where the avulsed UL1 was replanted and splinted but the intruded UR1 was not treated as it was misdiagnosed. He presented at the paediatric department 12+ hours post-injury. UR1 was allowed time to spontaneously erupt without splint removal. At 5 days, there was no improvement and traction was applied using a transpalatal arch and a bracket. At 5 weeks, UR1 was static and therefore surgically repositioned due to concern regarding its vitality, and splinted for 10 weeks. Both teeth were root treated. Clinical and radiographic review were carried out for 1 year 8 months and show intact periodontium with no sign of ankylosis UR1 and no root resorption UR1/UL1. The treatment of UR1 was both delayed and complicated by the fact that UL1 was avulsed and had already been replanted and splinted.

**Discussion:** How the intrusion was managed without detriment to UL1 to ensure the best long term outcome will be discussed to show what can be learnt from this case.

**Conclusion:** This case shows the need for initial correct diagnosis and treatment and the complex planning involved to maximise the long-term treatment options of two teeth with different injuries.

**May Parents Compliance Influence the Success of Dental Trauma Treatment in Children? A Case Report**

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**Introduction:** A dental abscess case in permanent tooth germ occasioned by grade III intrusion in primary teeth is presented.

**Case Report:** An infant, one-year eleven-months old, was attended by the university pediatric dentistry department complaining of 51 and 52 dental trauma, the day before. X-ray revealed grade III intrusion with rupture of alveolar bone. Amoxicillin was prescribed and exodontia of both elements was conducted; after a week, stitches were removed and healing monitored. She/family did not return to any one of the scheduled monitoring appointments within 1 year and 8 months. At 4 years-old, she returned with a large abscess in the 11 region, which had less than 1/3 of the crown erupted. Curettage was performed and amoxicillin prescribed aiming to keep the tooth, but when antibiotic effect stopped, the abscess recurred. To ascertain indication of exodontia, tomography scan was performed and revealed structural defects, development delay and extensive bone resorption of 11. With parental agreement tooth extraction was performed and the specimen underwent histopathological analysis.

**Discussion:** Tooth structure damage to permanent germ did occur at the trauma moment in primary teeth because of their physical proximity, but proper monitoring could have prevented a major infection in permanent germ. If tooth germ infection had been detected early, curettage of the lesion and prescription of antibiotics could have led to better outcome of the case.

**Conclusion:** This case reinforces the importance of parents' compliance in dental trauma monitoring appointments to mitigate the implications arising from trauma and improve prognosis.

## Dental Trauma

**Eruption of a Mineralized Tooth like Structure Adjacent to a Primary Mandibular Molar: Erupted Odontoma or Tooth Germ Sequestration?**

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**Introduction:** Erupted odontomas are rare and in primary dentition are even rarer. The occurrence of this hamartoma may be related to local trauma, infection or genetic mutations. Dental sequestration, on the other hand, is associated with dental trauma and / or dental infection.

**Case report:** This study reports on a 4-year-old boy attended the Department of Pediatric Dentistry complaining of pain in region of the primary left mandibular second molar. Intraoral inspection revealed a hard tissue specimen in lingual position of 75. Periapical radiograph revealed a mineralized structure with different radiopacity levels. Oral and radiographic findings led to provisional diagnosis of complex odontoma. Treatment option was outpatient surgical removal of specimen, which was carried out at the same appointment. Removed specimen was whitish, hardened in consistency and one surfaces resembled an abnormal occlusal surface. Histological analysis was consistent with organized layers of dental tissues. Postoperative panoramic radiograph revealed absence of the successor tooth dental germ (35), while teeth 15, 25 and 45 were present, in fifth stage of Nolla, giving rise to hypothesis of tooth germ sequestration.

**Discussion:** The mechanism by which an odontoma erupts is not clear; it seems to be related to the bone remodeling process. On the other hand, dental sequestration is associated with dental trauma and / or dental infections. In both cases, none of the predisposing factors were identified.

**Conclusion:** Although the definitive diagnosis cannot be established, the treatment performed proved to be effective.

## Management and Treatment of Young Adult Dental Trauma: A Clinical Case Report

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**Introduction:** A crown-root fracture is a type of traumatic injury that involves enamel dentin and cementum. In some cases the fracture line extends subgingival and causes pulpal involvement. Diagnosis is made by clinical examination, mobility testing and radiographic examination. If the crown fragment is kept in place by fibers of the periodontal ligament, the patient will generally complain about sensitivity to pressure and/or percussion leading to discomfort.

Different treatment options exist and will depend on the extent of the subgingival lesion, morphology, the length or the morphology of the root and the situation in an esthetic sensitive region. Treatment options include: fragment removal followed by restoration; gingivectomy; orthodontic extrusion with or without gingivoplasty; surgical extrusion; root submergence; and extraction.

The aim of the case report is to present the multidisciplinary management of a complicated crown-root fracture that extended subgingivally in an anterior tooth.

**Case report:** A 10-year-old healthy male patient presented to our clinic complaining of pain on biting. Mother stated that he was hit on his face a month ago and did not seek treatment since. Upon intraoral examination tooth #7 was surrounded by a bulbous and an inflamed marginal gingiva. Moreover, tooth #7 has grade 2 mobility.

Periapical x-rays were taken, and it revealed a crown root fracture with periapical radiolucency.

Treatment options were given to mother:

- 1) Extraction of the tooth
- 2) Endodontic therapy to preserve bone surrounding tooth structure, fragment removal followed by restoration and future implant placement.

Mother choose to preform endodontic treatment and future placement of implant. Pulpal debriment was achieved and medicament was placed. On the following visits, root canal therapy, gingivectomy using diode laser and prefabricated post and composite crown was carried out. Patient returned for follow up appointments and definitive implant placement will be carried out in the future.

**Discussion:** Dentoalveolar trauma occurs in 5% of all injuries affecting adolescents. Crown fracture has been reported to be the most common dental trauma, followed by luxation injuries for permanent dentition. On the first visit enlarged gingiva was biopsied.

**Conclusion:** Treatment of a crown root fracture due to dentoalveolar trauma requires a multidisplinary approach. Preservation of tooth structure and surrounding bone is especially important in a young child until further future final replacement.

# *Education in Paediatric Dentistry*

## Education in Paediatric Dentistry

**Implementation of a Course and Clinic for Cleft and Craniofacial Conditions in the Advanced Education Program in Pediatric Dentistry of NYU College of Dentistry**

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**Background:** Individuals born with a cleft/craniofacial condition still experience significant disparities in the quality of healthcare that they receive despite its high incidence.

To address these disparities and the lack of training of future pediatric dentist, the Department of Pediatric Dentistry of NYU College of Dentistry developed and implemented a craniofacial (CFC) curriculum in the postgraduate training program in Pediatric Dentistry through clinical and didactic components.

**Methods:** In 2014 a monthly CFC clinic day at NYU's Dept. of Pediatric Dentistry was established where the postgraduate students see and treat patients with a cleft/CFC.

Due to its success and growth, a didactic component was added in 2018, consisting of a course seminar series highlighting all aspects of care required for patients with a cleft/CFC.

The knowledge of the postgraduate students acquired throughout their 2-year training program was tested in the middle and the end of every academic year.

Patients/families satisfaction was queried yearly as well.

**Results:** Without the didactic component, postgraduate students were missing knowledge and skills needed to adequately treat and feel comfortable taking care of these patients.

Patients/families satisfaction has grown every year.

**Conclusion:** There is a lack of training about cleft/craniofacial conditions in the postgraduate training programs in pediatric dentistry leading to poor dental/oral care of patients with a cleft/craniofacial condition because of lack of knowledge and preparedness about the overall multidisciplinary care. Adding a specific lecture series alongside the clinical experience is crucial to improve the skills of future pediatric dentists and to improve the dental/oral care of patients with a cleft/craniofacial condition.

**Effectuality of Oral Health Promotion in Children: A Systematic Review**

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**Background:** The beauty of pediatric dentistry is we assign manpower and resources to benefit the younger population. Oral health promotion has a main objective to improve knowledge and elect advantageous behaviours that can improve clinical oral health. The aim is to determine the efficacy of oral health promotion in children.

**Literature Review:** The pubmed/ MEDLINE, EMBASE, Cochrane and Science Direct databases were searched for articles in english published between the year 2000-2020. Articles were identified by an extensive literature search and the relevance was determined based on predetermined criteria by three individual reviewers. The publications were grouped based on their outcome measures. The measures included caries incidence, toothbrushing skills, gingival health, knowledge, attitude and behaviour towards oral health.

**Conclusion:** The study showed that oral health promotion is effective and has a positive influence towards visits to the dentist, dental attitude, flossing behaviour, toothbrushing habits. Further efforts are however required to systematically incorporate information about oral health education along with maintaining the standard of research.

### **Early Diagnosis and Multiprofessional Approach to an Infantile Hemangioma Case: 1-year Follow-up of Propranolol Treatment**

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**Introduction:** Infantile Hemangioma (IH) is a common benign vascular tumor in childhood, being more prevalent in females.

**Case report:** It aims to present an infantile hemangioma first detected by a pediatric dentist, in a 4-month-old girl. The infant was referred to the university pediatric dentistry department due to purple spots on the tongue. Clinical examination gave rise to the hypothesis of infantile hemangioma at the right side of the tongue. Infant was referred for a pediatric vascular surgeon who after magnetic resonance imaging established a diagnosis of infantile hemangioma. Treatment option was oral propranolol, following FDA recommendation (2014). After six months, clinically significant regression was observed and pediatric surgeons interrupted propranolol usage. One-year follow-up revealed that clinical lesion's dimensions remained stabilized as when propranolol was discontinued.

**Discussion:** The case here described emphasizes the importance of pediatric dentists in diagnosis and prompt treatment of oral lesions in infants. Besides, the pediatric dentist took part in monitoring infant's oral health concomitantly to lesion control. Parents were advised about oral health care and about measures to prevent trauma of the lesion that could cause bleeding, ulcerations and secondary infections. Special attention was given to dental eruption because of accidental bite injury while playing or walking, and also to avoid putting sharp-pointed objects into mouth.

**Conclusion:** This case highlights the importance of a multi professional approach to early diagnosis and prompt treatment of oral lesions. Education about oral health care and trauma prevention were key factors to prevent complications through 1-year of follow-up.



**Using Plickers to Stimulate Critical Thinking in Postgraduate Dental Students in Paediatric Dentistry**

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**Background:** All university students are considered adult learners who should be self-motivated. Postgraduate students are however expected to engage on a higher level than undergraduates as they already have some work experience. Even though it is thought that practitioners already engage in reflective practice and critical thinking in order to practice successfully, this is not always the case. Complacency after graduation and not keeping up with the latest developments in the field, results in some adult learners still struggling with certain concepts especially when it comes to the integration of knowledge and application thereof in clinical practice.

**Methods:** A tutorial was conducted for a group of postgraduate students to consolidate a difficult clinical topic in Paediatric Dentistry and assist them to make the connection between theory and practice thereby honing their critical thinking skills. The tutorial involved placing multiple choice questions on the Plickers platform to assess the areas that needed development.

**Results:** Plickers was used as a form of formative assessment where feedback was obtained during the learning process and deficiencies in knowledge could be addressed immediately. This interactive learning tool is simple, cost-effective and easy to use. It was also very well-received by the students.

**Conclusion:** The tutorial demonstrated that interactive learning activities can assist students to make sense of content that can be very overwhelming and confusing.

**Dental Case: A Serious Game on Pregnant Women Dental Care**

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**Background:** Many dentists feel unsafe and do not show confidence to act in the dental treatment of pregnant women. The health professional's permanent education could have new approaches like digital games, both effective and easily disseminated. Onto the context of widespread usage of the internet, diffusion of digital games and more engaging educational practice, the serious games emerged. This abstract presents the DentalCase, a serious game designed for mobile technology that seeks to contribute to the dental-surgeon qualification in an interactive way, providing a review of the acquired knowledge in the professional education in the topic of pregnant women's dental care.

**Methods:** DentalCase was developed by a multidisciplinary crew integrated by professionals from different areas (technology, design, odontology, education, among others). A dentist professional was responsible for the content and narrative creation.

**Results:** The game's content was based on a literature review on the pregnant women's oral health, in which the most relevant themes were selected. In this game, the player takes the role of a dentist in clinical practice, whose mission covers five stages: anamnesis, clinical exam, complementary exam, diagnosis and treatment. The presented situations in the game were designed to be similar to common situations in the context of primary health attention. The elaborated content was revised and validated by specialists and educators. After adjustments, the content was moved to the tool specially designed for DentalCase.

**Conclusions:** The DentalCase's big challenge is to keep in balance two the two most important dimensions: content and entertainment.

**Computer-controlled Local Anesthetic Delivery for Painless Anesthesia: A Scholarly Review**

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**Background:** Dental visit is avoided by most of the patients because of dental fear. There are a variety of reasons for dental fear, including noise and vibration from tooth-cutting devices such as dental hand pieces, smell of drugs or materials used in dentistry, and pain in dental treatment. Because of painful dental treatments, appropriate local anesthesia is necessary to reduce pain during such treatments. Many “computer-controlled local anesthetic delivery” devices have been introduced that can inject local anesthetic into the tissues at a set speed.

**Literature Review:** The findings from studies for comparison of CCLAD and local anesthesia using conventional syringes on children was done. Among 13 studies that assessed pain, six reported similar measured values, while seven determined CCLAD to be more effective in that it caused less pain and allowed behavioral control. The method most often used to assess the effects of anesthesia was visual analog scale (VAS), indices that assess facial or bodily responses, such as sound, eye, motor scale (SEM), face legs activity cry consolability (FLACC), facial image scale (FIS), and faces pain rating scale (FRS).

**Conclusions:** The results of the reviews indicate that using CCLAD resulted in less pain and more effective anesthesia in children. Recent advances in CCLAD have led to the introduction of products that are lighter and easier to use.

**Evidence based Laser Pediatric Dentistry: A Review of Literature**

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**Background:** The main aim of pediatric dentistry is to provide preventive education to parents and patients as well as interception of Dental Diseases in a minimally invasive way possible using a stress- free approach. The most common objective is preservation of tissue. With the availability of new techniques like diagnostic laser, digital radiology, we can account for proper diagnosis and treatment planning.

**Literature Review:** The use of lasers in treating oral diseases and providing therapy for the lesions of oral mucosa has specific applications in pediatric dentistry. Use of different lasers in patients with periodontal diseases has wider use in pediatric dentistry. The soft tissue lesions of oral mucosa and soft tissue orthodontic problems are effectively treated with lasers. The use of CO2 laser irradiation of young healthy teeth could be an effective method for caries prevention. Laser irradiation cannot eliminate the need for acid etching prior to fissure sealant. Laser irradiation can be considered an additional tool in sealant application procedure. Lasers are also indicated for pulp capping, pulpotomy, and root canal disinfection. Many authors reported how adhesion to laser ablated or laser-etched dentin and enamel of teeth is lowered compared to conventional rotary preparation and acid etching.

**Conclusion:** Laser is very effective and represents a good treatment option. It enables optimal preventive, interceptive, and minimally invasive interventions. It is very important for the professional to understand the characteristics of different laser wavelengths so as to ensure that they are used in a safest way possible for young patients.

**Save the Sixes – The First Permanent Molars: Review**

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**Background:** The first permanent molar (FPM) plays an essential role in the masticatory function by contributing to the implementation and the maintenance of the occlusion. However, it is considered as the most frequently affected and the earliest affected tooth by caries. To ensure that any early carious lesion is intercepted. Therefore, making it essential to take all the necessary special precautions to save it in the oral cavity.

**Literature Review:** The FPM helps in maintaining the occlusal morphology, distribution of masticatory forces and arch perimeter. According to a study conducted by Phipps KR, Stevens VJ (1995) periodontal disease is the main cause of loss of permanent molar. The FPM, due to its period of mineralization coinciding with early childhood diseases, can erupt with a structural abnormality. Molar incisor hypomineralisation (MIH) is considered to be the most common defect observed on the first permanent molars among children. 7.9% of children were affected with MIH. About 84.7% of the children had the four molars affected. Children with MIH had a significantly higher prevalence of caries: 78.8 versus 33.5%. These structural abnormalities of the enamel must be corrected out earlier to ensure that the coronary anatomy is the least compromised. The consequences of losing the first permanent molar are severe. Such as severe mesial tipping of the second permanent molar, supra-eruption or over eruption of the antagonist first permanent molar and migration or distal tipping of the second premolar.

**Conclusions:** Etiology, prevalence and consequences associated with the FPM makes it of high importance requiring special attention from day one as it is the first permanent tooth to erupt. All necessary preventive measures should be directed towards saving the six in the oral cavity from the time of eruption.

### **Oral Hygiene Protocol in Children with Cancer in Marrakech: Application and Assesment of Acceptability in Children and Parents**

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**Background:** Chemotherapy and radiotherapy are the main ways of treating childhood malignancy. Children have effects of chemotherapy and/or radiotherapy on oral structures such as mucositis, xerostomia, oral fungal infections. The management of these complications is a priority. It's an epidemiologic study aimed at establishing an easy and applicable protocol and than evaluating its feasibility and acceptability for 53 children and their parents at the department of Hematology and Oncology of Marrakech in Morocco

**Methods:** the oral protocol evaluated consists of dental brushing, oral rinses (saline or bicarbonate) and fluoride mouthwash. sensitization by using brochures and motivational macromodel and distribution of oral hygiene kits. The assessment of acceptability was made after one month of application of the protocole, using a questionnaire

**Results:** The result shows that the protocol was easy to understand and to apply. 84% of the children applied the protocol and 80% saw their oral condition improved. The results also revealed that 36% of children needed parental help for the protocol

**Conclusions:** The choice of our protocol was made on several criteria, starting with the latest recommendations from the AAPD, socio economic level of patients, ease of application. The acceptability rate of the protocol was interesting, however a number of difficulties were encountered, mainly the difficulty of applying certains protocol gestures and the young age of certain patients parental support and the involvement of the children in the therapeutic strategy are key elements in the success of the protocol.

**A Pandemic that Brought Out the Best in Pediatric Dentistry Continuing and Advanced Education**

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**Background:** Around March 2020, most countries implemented a shutdown due to the COVID-19 pandemic. With lockdowns and governmental restrictions on dental practices, pediatric dentists found themselves with time towards online professional development. Most dentists now explored new, innovative techniques and evidence-based data as to how they could serve their patients better.

**Methods:** This study assessed online continuing education (CE) courses available between March and August 2020, from more than 10 dental organizations that focused on scientific and clinical courses that catered towards the oral health of pediatric populations. It was divided into 2 major categories – Behavioral and Clinical Sciences.

**Results:** The abiding areas are quantified into behavioral sciences such as pharmacology, microbiology, embryology, anatomy, and oral pathology; clinical aspects such as behavior guidance, growth and development, oral facial injury and emergency care, prevention and health promotion, comprehensive dental care, special health care needs, hospital dentistry, and pulp therapy. Miscellaneous categories include biostatistics and clinical epidemiology, genetics, oral diagnosis and medicine, contemporary dental practice, practice medicine and advocacy.

**Conclusion:** With the openings of dental clinics, hospitals and dental schools, practicing dentists are more exposed to new advances in pediatric literature, training and clinical procedures as well as evidence-based practices. More dentists and organizations should plan to hold and conduct future CE courses at convenient time slots like lunch hours, late evenings, and weekends and consider providing recordings for all registered attendants.

**Teledentistry Practice during COVID-19 Pandemic: Literature Review**

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**Background:** The COVID-19 pandemic has challenged the existing healthcare systems across the globe. During the current pandemic, most routine dental procedures all around the world, have been suspended, and only emergency dental procedures and surgeries are being performed by the oral Health Professionals. Teledentistry is the provision of dental care or treatment through the medium of information technology without having direct personal contact with the patient. All the applications used in Teledentistry leads to the improvement in quality of care and reduction in oral disease.

**Literature Review:** Teledentistry offers a wide variety of clinical applications ranging from patient's records management, diagnosis, and clinical decision making. It can help in providing health care services to remote areas by specialists. Teledentistry is a fast-growing field with a lot of potential, but it is still in its infancy. In today's circumstances of ongoing COVID-19 pandemic, with increasing likelihood of it becoming endemic, the main aim of using this technology, is to avoid person-to-person contact.

**Conclusion:** Dentistry has become severely compromised because of COVID-19. Incorporating teledentistry into routine dental practice has become more important now. Teledentistry can complement the existing compromised dental system during the current pandemic. Teledentistry is good option for consultation, diagnosis, education and training purposes.



**Knowledge, Attitude and Practice of Dietary Habits among Parents of Infants and Toddlers: A Pilot Survey**

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**Background:** Dental caries is the most common childhood disease globally. Therefore, the need to focus on prevention of dental caries is of utmost importance to the scientific community. This study focuses on the relevant risk and protective factors that are likely to have an influence on oral health in infants and toddlers.

**Methods:** A questionnaire consisting of 20 questions to evaluate dietary habits and oral health of their children was prepared and distributed to parents of children aged between 6 months to 3 years who reported to the department. Data was collected from a total of 157 participants. The results were tabulated and statistically analyzed.

**Results:** The child's mother was the most common parent respondent (98%). Majority of the children were exclusively breastfed. Children showed frequent sugar consumption and snacking between meals. 83.4% parents did not know the age for weaning from nursing or the bottle. 46.4% were given fruit juices and 17.8% were given other sugar containing drinks through the nursing bottle. 65.6% did not know that toothpastes formulated for children are commercially available.

**Conclusions:** Overall knowledge of parents were fair but implementation of the same were compromised. Oral health prevention programs should reach children before they establish unhealthy dietary and oral hygiene habits. Parental education and motivation are important to improve the children's oral health.

**Passive Smoking and its Effects on the Development of a Child**

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**Background:** Passive smoking is the inhalation of tobacco smoke exhaled by a smoker. There is no safe level of second-hand tobacco smoke exposure. Almost half of the air children regularly breathe is polluted by tobacco smoke in public places. This poster delves into the consequences of passive smoking on the physical, cognitive, and dental development of the child. It also brings to light the deleterious cardio-vascular effects of nicotine exposure.

**Literature Review:** Studies by Lymperaki, Rahman and Zhang have shown that tobacco transiently increases the systolic blood pressure and decreases the arterial compliance, thereby increasing the susceptibility to hypertension. Research papers by Avsar et al and Muraro et al have also observed that exposure to tobacco smoke delays the dental development amongst children and displays a negative association in the linear growth of the child.

**Conclusions:** The WHO recognizes that exposure to tobacco smoke causes death, diseases, and disabilities, and has asked countries to adopt and implement legislation that provides protection from second-hand smoke exposure. It is imperative that parents be made aware of the possible consequences that can arise due to the seemingly harmless passive smoking. Through this poster, we aim to educate the parents, and hope for a brighter future.

Education in Paediatric Dentistry, Endodontics, Periodontal Disease in Children, Restorative Dentistry

### **Oral Rehabilitation in a Pediatric Patient with Malnutrition: A Case Report**

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**Introduction:** Malnutrition refers to an imbalance between the nutrient supply and the body's demand to guarantee tissue growth. This alteration results in generalized tissue hypotrophy due to lack of nutrients, which leads to oral cavity repercussions, such as a decreased buffer capacity of saliva that triggers dental caries.

**Case report:** A four-year-old male patient, whose diagnosis is Early Childhood Caries, presented with abscesses and generalized gingivitis. After obtaining an adequate medical history and signed informed consent from his parents, a comprehensive rehabilitation, including pulpal and restorative treatments, was planned. Results of a 1-year follow-up will be presented.

**Discussion:** The aim of comprehensive oral rehabilitation in pediatric patients is to preserve the integrity of primary dentition in order to: avoid delays in the patient's growth and development, prevent malocclusion, reduce harmful habits, prevent psychological sequelae, and improve cognitive development, phonation and mastication.

**Conclusion:** Oral rehabilitation of pediatric patients with systemic compromise and Early Childhood Caries can restore their quality of life and improve their psychosocial well-being.

**Apexification and Revascularisation: Comparative Literature Review of their role in treating Necrotic Immature Permanent Tooth**

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**Background:** Necrotic immature permanent teeth cater reportedly is 30% of dental trauma injuries. The need to conserve the natural tooth and promote its natural biological growth process has always been a priority for a pediatric dental clinician. Appropriate endodontic treatment for a necrotic immature permanent tooth proves to be a challenge due to its thin dentinal root walls and wide apical foramen.

**Literature Review:** Apexification has been an age old highly practiced treatment modality in providing a calcific barrier at these open apices using either calcium hydroxide or mineral trioxide aggregate. Though this procedure is inexpensive and provides a good response, its shortcomings are determined by the lack of increase in root length, wall thickness and the tooth's susceptibility to future fractures. An alternative recently recommended treatment option is the technique of revascularisation. It provides an opportunity for root maturation of immature tooth by stimulating the periapical vital cells and re-establishing the pulp vascularity. The efficacy of pulp revascularisation as a regenerative endodontic procedure option is currently being studied.

**Conclusions:** Since revascularisation technique is said to be a paradigm shift in the treatment protocol of necrotic immature permanent teeth, a review of comparison with its conventional treatment option is necessary for better clinical judgement. This poster reviews the published literature and provides comparison of different aspects determining the clinical advantage between the conventional apexification procedure and the promising technique of pulp revascularisation.

**Role of Pedodontist in the Management of Cleft Lip and Palate Patients**

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**Background:** Cleft lip and palate is one of the most common anomalies found due to some unknown disturbances during embryogenesis. The etiology is attributed to genetic and environmental factors. The incidence ranges from 1 in 800 births to 1 in 1200 births. The management of cleft lip and palate patients requires an efficient multidisciplinary team.

**Literature Review:** This poster deals with the types of cleft lip and palate and the management of the patients by a pediatric dentist by review of literature. The pediatric dentist provides supportive care, maintaining oral hygiene, behavioral and preventive management and following the patients from the primary dentition period to the transition to permanent dentition with interceptive treatment procedures.

**Conclusions:** The pediatric dentist plays a dual role in improving the personal impact as well as improving the surgical outcome. Pediatric dentists play a key role in providing continuing, high quality and preventive dental care.

**Acute Dentofacial Pain Management in Children**

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**Background:** Dental pain is one of the most common symptoms of untreated oral problems and exerts a strong impact on the well-being of children.

**Literature Review:** Oral conditions such as dental pulpitis, dentoalveolar abscess, ulceration, tooth eruption, traumatic injuries and untreated dental caries are most strongly associated clinical finding. Description of the pain is challenging with very small children due to cognitive immaturity and difficulty in verbalizing the feeling of pain, but can be recognized through difficulties to eat or sleep as reported by parents. Children less than three, those with special needs, and those with higher dental anxiety are susceptible to pain and may need additional care. Child that experience pain in dental setting may subsequently develop dental fear anxiety, and begin to avoid dental appointment and develop poor dental health. Communication between child and dentist is important. Pain management includes non-pharmacological measures such as making calm environment, distraction, tell show do, or pharmacological like administration of topical, local anesthetic, and analgesic medication. NSAIDS are considered as the first line treatment and act by reducing the inflammation ; acetaminophen acts by blocking the transmission of pain.

**Conclusions:** Pain management should be done by understanding the needs and feelings of young patient with proper diagnosis and management of condition which will effectively result in a cooperative child with good oral health.

**Local Anesthesia Techniques in Pediatric Dentistry**

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**Background:** Fear of pain can become an obstacle to successful dental treatment in children. Dentists need to be aware of this challenge and develop effective techniques to reduce pain for their patients. Even though pain associated with local anesthesia generally subsides following administration, delivery of local anesthetic can be challenging.

**Literature Review:** The conventional way of delivering local anesthesia using syringe and needle can produce anxiety and apprehension in some patients even before it commences. Fear of injections may lead to reluctance on the part of the child or parents to seek treatment in the future. Hence, it is important to be informed about a range of effective techniques to minimize pain associated with local anesthesia delivery, such as computer controlled local anesthesia delivery systems, use of various topical anesthetics, jet injectors and laser analgesia. This presentation highlights a number of techniques for administering local anesthesia.

**Conclusions:** The key to managing children's anxiety associated with dental treatment lies in the effective delivery of local anesthesia. This poster reviews published and clinically established modes of local anesthesia delivery, emphasizing techniques that go beyond the use of conventional needle and syringe.

**Children's Drawings in Pediatric Dentistry: A Scoping Review**

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**Background:** Knowing the expectations of children in relation to the dentist and their work environment can help the pediatric dentist to interpret the behavioral variables and establish a management according to the characteristics of each patient. The aim of this study was to evaluate if drawings may be used to understand the children's fear, anxiety and stress and perceptions about dentist and dental treatment by conducting a scoping review.

**Methods:** The databases PubMed, Cochrane, EMBASE, LILACS, Scopus, Web of Science, and PsycINFO until April 9, 2020. Grey literature was searched on Google Scholar, Open Grey and ProQuest Dissertations and Theses Database. Cross sectional, quasi-experimental and qualitative studies were included. Two authors independently assessed studies for selection, extracted data, and evaluated bias (Joanna Briggs Institute). Data collected included: characteristics of the studies, population, setting, objectives, drawing evaluation/scales, main results and conclusion.

**Results:** A total of 1529 articles were initially identified, and after a 2-phase selection, 23 studies were included in the narrative synthesis. Twelve studies evaluated drawing as a measure or instrument for child's fear, anxiety, stress and eleven studies verified the children's perception regarding dental treatment measured through drawings. The majority of included studies showed a low risk of bias.

**Conclusion:** It can be concluded that drawings can be a useful tool in identifying children's emotions and perceptions about dentist and dental treatment. In future studies, it is recommended to evaluate confounding variables and the analysis of the drawings in a standardized manner and in comparison with other methods for evaluating anxiety and children's behavior.



### Oral Hygiene-Related Knowledge in Relation to the Oral Health in Adolescent Children in Latvia Longitudinal Study

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**Background:** Caries is the main oral health problem affecting school-age children. Thanks to modern prevention methods there has been a significant reduction in intensity of caries. The aim of study was to evaluate the oral hygiene-related knowledge, self-efficacy and motivation of adolescent children, with their current oral hygiene practices to assess the effect of patient motivation after regular professional dental hygiene.

**Methods:** The study included 102 thirteen-year-old children (56 girls, 46 boys). Caries intensity, assessment plaque, dental calculus and periodontal status was determined during the visit. Children underwent professional oral hygiene, were motivated to maintain good oral health and interviewed about their oral hygiene routine. Oral health status was determined every six months for five years. In the analysis of data of the study subjects, descriptive and analytical statistical measures were calculated using IBM SPSS 22.0.

**Results:** At baseline, the mean DMFT index was 4.58 (SD=3.09), but DMFS was 7.57 (SD =6.63). The DMFT increased ( $p < 0.001$ ), reaching 5.28 (SD=3.62); the DMFS also increased ( $p < 0.001$ ), reaching 9.10 (SD=7.77). Incipient lesions decreased from 2.87 (SD=2.65) at baseline, reaching 2.74 (SD=2.89) ( $p < 0.001$ ). The number of filled teeth increased, reaching 3.67 (SD=2.57) with 4.29 (SD=3.20) at baseline ( $p < 0.001$ ). The number of healthy sextants was 3.22 (SD =1.99); it decreased reaching 2.65 (SD=2.12). These changes correlate with the number of bleeding sextants increasing from 2.2 (SD=1.81) to 2.49 (SD=2.03). The number of sextants with dental calculus was 0.55 (SD=1.0) at baseline and increased ( $p < 0.001$ ) reaching 0.84 (SD=1.3).

**Conclusions:** After five years, there were no visible improvement in oral health, but the patient education have implications throughout the most influential stages of children's lives, enabling them to develop lifelong sustainable attitude and skills on the oral health.

**Chair Side Space Maintainer: Case Series**

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**Introduction:** Though preventive, restorative and pediatric endodontics has come long way in pediatric dentistry but still sometimes we have to decide to prematurely extract a tooth and maintain the space until the permanent teeth erupt. . Space management concepts in paediatric dentistry has hardly undergone any changes and customised space maintainers are still choice of treatment with only the only disadvantage of multiple appointments.

**Case Report:** In this case series total 21 band and loop space maintainers were placed with 11 customised and 10 chair side space maintainer in 9 children aged between 3 to 7 years old. The preformed band selection was done as per tooth size. These bands were spot welded with part B of loop. The loop (Part A) with various sizes were selected, adjusted and crimped. The various factors such as gingival health, de-cementation, breakage of appliance and parents satisfaction were assessed with three, six and 12 month follow up. Out of 10 chair side space maintainer one space maintainer got de-cemented and two chair side space maintainer got de-cemented. Out of 10 chair side space maintainers 3 obstructing erupting premolar and has to be removed immediately.

**Discussion:** The advantage of chair side space maintainer as it can be delivered in same appointment so less time consuming and accepted well by parents. Another advantage is there is no need of impression, band transfer and soldering process. There are certain shortcomings such as loop is not following gingival contour and most important width of loop is very much less as compared to buccolingual width of premolar so regular follow up is necessary. There was no significant difference between gingival health and de-cementation with both types of space maintainer.

**Conclusion:** The chair side space maintainer are less time consuming and more beneficial to the patient and clinician. The same appointment, lack of soldering process are certain advantage. The loop width, necessity of frequent follow with chair side space maintainer are disadvantages . The long term follow-up with large sample size is necessary.

**Teledentistry during and after the COVID-19 Pandemic: Preparing to New Normal**

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**Introduction:** The epidemic of COVID-19 (SARS-CoV-2) caused the interruption of dental care in dental courses, affecting many patients. In 2018, 54,807 patients were treated at the Faculty of Dentistry of the University of São Paulo, 2191 in Pediatric Dentistry. The return to attendance at colleges is complex due to the high risk of transmission. Institutions like WHO, FDI and ADA have recommended virtual consultations to replace, when possible, face-to-face consultations. The objective of this report is to present the implementation of a teledentistry service and its impact on patients' oral health.

**Case Report:** This is a report of a case of implementing a teledentistry service for virtual consultations for telemonitoring and teleorientation of 128 infants and toddlers, aged 0 to 3 years, whose face-to-face service was interrupted. A computer system for remote consultation was developed using a strict protocol, the Secure Real Time Protocol (SRTP), allowing the security of the transmitted media ensuring encryption, confidentiality, message authentication and response protection for the transmission of audio and video traffic. Parents will be guided virtually every 3 months.

**Discussion:** Involving changes in patient care practices and the use of devices and new technologies, the adoption of teledentistry is complex and disruptive. The clinician must be aware of the limitations. Education and training are important.

**Conclusions:** The use of teleconsultation is expected to be effective in promoting and maintaining oral health for patients, partially supplying the interruption of face-to-face service with a good cost-benefit ratio.

# ***Endodontics***

## M1 and M2 Macrophages Phenotypes Modulation after Stimuli with Different Materials used in Endodontic Treatment

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**Background:** Macrophages are phagocytic cells, that have considerable morphological, functional and marker expression heterogeneity. Depending on the microenvironment to which the monocytes and their progenitor cells are exposed, their phenotype is defined as "classically activated" (M1) or "alternatively activated" (M2). M1-macrophages mediated pathogen resistance, presenting antimicrobial and anti-tumor activities, high nitrogen and reactive oxygen production, promoting Th1 responses. On the other hand, M2-macrophages modulate inflammatory response and wound repair. The aim of this study was to evaluate the M1 and M2 macrophage modulation after stimuli with different materials used during endodontic treatment.

**Methods:** After bone marrow-derived macrophage cells were exposed to five endodontic sealers (AH Plus<sup>TM</sup> Sealapex Xpress<sup>TM</sup>, Endosequence<sup>TM</sup>, BioRoot<sup>TM</sup>, Endomethasone<sup>TM</sup>) and a calcium hydroxide-based paste, qRT-PCR and Luminex<sup>®</sup> was used for identification of M1- and M2-macrophages. For normal values, the ANOVA test was used, followed by the Tukey post-test. For non-normal values, the Kruskal-Wallis test was used. All data were analyzed using GraphPad Prism 7.0a software ( $\alpha=5\%$ ).

**Results:** BioRoot<sup>TM</sup> RCS and EndoSequence BC Sealer<sup>TM</sup> stimulated the highest expression of markers for M1-macrophages, while calcium hydroxide-based paste stimulated the lowest expression of these gene markers. For the M2 protein marker, BioRoot<sup>TM</sup> RCS presented the highest stimulation, while calcium hydroxide-based paste also presented the lowest stimulation.

**Conclusion:** It was concluded that the evaluated materials increased the genetic expression of pro- and anti-inflammatory markers. However, this process did not induce the inflammatory response polarization, resulting in a hybrid macrophage.

**Accessory Canals and Dentin Permeability in the Furcation of First Primary Molars**

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**Background:** Furcational lesions has been associated with different causes over time, including complex morphology of deciduous teeth, presence of accessory canals, and the greater dentin permeability. The purpose of this study was to evaluate the relationship between the presence and diameter of accessory canals with the permeability of dentin at the furcational level in the first primary molars.

**Methods:** An in vitro study was carried out in 39 first primary molars. The molars were evaluated initially with a digital microscope after coloring and in a second phase to correlate the data between decalcification with digital microscopy and histological sections.

**Results:** The findings from 135 accessory canals showed that the most prevalent shapes were oval (73%), round (17.7%) and irregular (9.2%). It also was observed that the mandibular molars showed a greater number of accessory canals compared to the maxillary molars; however, the maxillary molars showed a greater average in the diameter 75.55  $\mu\text{m}$  (SD 106.64  $\mu\text{m}$ ).

**Conclusion:** The relationship between the presence and quantity of accessory canals in the maxillary and mandibular first primary molars can generate greater dentine permeability at the furcational level.

**Revascularisation Revisited-Natural, Faster Root Formation**

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**Introduction:** Endodontic treatment in an immature permanent tooth which is either traumatized or cariously exposed is difficult to perform. The root canals of these teeth are open as well as fragile for instrumentation and obturation. The age-old treatment of apexification, consisting of insertion of calcium hydroxide paste into the root canal for a predetermined time but newer methods are evolving.

**Case Report:** An eight-years-old female child reported with a trauma to upper lateral incisor of left side with an abscess. The trauma occurred 1 year back. The patient had visited a local dentist initially but no treatment was meted out. The patient visited us after a year with abscess. The intra-oral radiograph showed the presence of open apex for the affected tooth. Revascularization has emerged as an alternative over calcium hydroxide apexification, with a varied range of treatment protocols which can be found in the scientific literature. Revascularisation was attempted in this tooth after consent from parents using triple antibiotic paste (cefaclor, ciprofloxacin, metronidazole), with copious irrigation with 3% NaOCl and 17% EDTA. This was done in two visits and proper closure of access cavity. The closure of apex was seen in 9 months.

**Discussion:** The main advantages of revascularization technique over the traditional apexification or artificial barrier technique in endodontic treatment of immature necrotic teeth include continuation of root development and strengthening the root structure.

**Conclusion:** The favorable results in this case show that regenerative endodontic treatment of pulpally involved traumatized necrotic immature tooth is a viable alternative to apexification or artificial apical barrier techniques, for permanent teeth.

## Evaluation of Endodontists' Treatment Approaches during the COVID-19 Pandemic: A Questionnaire-Based Survey

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**Background:** This study evaluated endodontists' treatment approaches during the COVID-19 pandemic.

**Methods:** Web-based 16-question survey was sent to members of the Turkish Endodontic Society via social media and email during May 5-25, 2020. The survey includes information about the members' demographic characteristics, and treatment approaches of seven cases considering COVID 19 pandemic. Statistical analysis was performed using a chi-square test.

**Results:** Of the 203 respondents, 65.5% were female, 34.5% were male; 62.6% were endodontists, 37.4% were PhD students; 68% worked at a university, 21.2% worked at private clinics, and 10.8% worked at public clinics. Most of the respondents frequented work once a week (31%) and most commonly gave treatment for "acute apical abscess" (32.2%) and "symptomatic irreversible pulpitis" (30.8%). The respondents selected most frequently to prescribe antibiotics and/or painkillers and postpone the treatment in Cases 1 and 6, to follow-up in Cases 2 and 5, to extract the tooth in Case 4, and to start endodontic treatment but postpone the treatment by placing antibacterial medicament into the root canals in Cases 3 and 7 (p.05).

**Conclusion:** The main goal during pandemic should be to delay the treatment by eliminating the acute symptoms of the patients. For this, deep carious teeth can be treated with minimal invasive dental treatments. In the post-pandemic period, the aim should be to complete the treatment in a single session and to ensure that necessary measures are taken for environment safety.



### Evaluation of the Efficiency of Different Root Canal Techniques in Primary Teeth

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**Background:** Endodontic instruments play a major role in the success of root canal treatment. The purpose of the present in vitro study was to evaluate the efficiency of three different instruments in the root canals of primary teeth.

**Methods:** Sixty artificial primary molars were separated into three groups of 20 teeth. Each group was submitted to a different technique. Group 1: conventional manual technique using Kerr files (DENTSPLY SIRONA); Group 2: manual technique with nickel-titanium files (Easy ProDesignM); Group 3: NiTi rotary technique (Easy ProDesign LOGIC). The root canals were filled with calcium hydroxide paste (SS White). Final radiographs of all teeth were obtained to determine the quality of the preparation performed by the three instruments and working times were recorded. The non-parametric Kruskal-Wallis and Mann-Whitney tests were used to compare root canal preparation times.

**Results:** All three techniques were effective at shaping the root canals of primary teeth. The working time was shorter with the rotary instrument ( $p=0.000$ ). In the pairwise comparisons, working time was shorter with the rotary instrument compared to the manual techniques with steel files ( $p=0.0003$ ) and NiTi files ( $p=0.0003$ ). Comparing both manual techniques, the working time was shorter with NiTi files compared to steel files ( $p=0.0113$ ). Moreover, less variability in the preparation time was found when the rotary instrument was used.

**Conclusions:** Rotary instruments are an efficient alternative to manual techniques, enabling a shorter working time, which favors the management of children in pediatric dentistry.

### Periapical Repair Following Root Canal Treatment: Inflammation, Osteoclastogenesis, and Expression of Matrix Metalloproteinase-9

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**Background:** Matrix Metalloproteinases (MMPs), are distinctly expressed in human apical periodontitis with intense synthesis in areas containing inflammatory cells. The aim of this study was to investigate the inflammatory infiltrate, osteoclastogenesis and expression of MMP-9 in apical periodontitis and following root canal treatment.

**Methods:** Apical periodontitis was induced in dog's teeth and root canal treatment was performed in a single visit or using an additional calcium hydroxide root canal dressing. 180 days following treatment the presence of inflammation was examined and the tissues were stained to detect osteoclasts by means of a tartrate resistant alkaline phosphatase (TRAP) assay. Synthesis of MMP-9 was detected using Western blotting and immunohistochemistry.

**Results:** Following root canal treatment, a lower number of inflammatory cells and MMP-9 positive inflammatory cells were found in teeth where calcium hydroxide was used. Teeth with apical periodontitis that had root canal therapy performed in a single visit presented a higher synthesis of MMP-9 compared to root canal treatment using calcium hydroxide. Osteoclastogenesis, the number of MMP-9 positive osteoclasts and cementocytes was reduced following root canal treatment, regardless of the root canal treatment protocol used.

**Conclusion:** Following root canal treatment, a lower number of inflammatory cells and osteoclasts were found in the periapical area. Teeth with apical periodontitis that had root canal therapy performed in a single visit, presented an overall higher synthesis of MMP-9, compared to root canal treatment using calcium hydroxide as root canal dressing, though the number of osteoclasts and MMP-9 positive osteoclasts were similar between the groups.

### Apical Periodontitis Progression is Impaired by Celecoxib and Indomethacin Treatment

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**Background:** The aim of this study was to evaluate in vivo the efficacy of selective and non-selective inhibitors of cyclooxygenase-2 enzymes in the treatment of experimental apical periodontitis induced by bacterial lipopolysaccharide (LPS).

**Methods:** Thirty-six C57BL / 6 mice were used in which a solution containing E. coli LPS (1.0µg / µl) was inoculated into the root canals of the first molars. After 30 days apical periodontitis was established. The animals were treated with Celecoxib - a selective COX-2 inhibitor (15 mg / kg) or Indomethacin - a non-selective COX-2 inhibitor (5 mg / kg) for 7 and 14 days. Evaluation of gene expression was performed using qRT-PCR, bone resorption using histological sections stained with hematoxylin and eosin. Osteoclastogenesis was evaluated using tartrate resistant acid phosphatase histo-enzymology. Data were analyzed using the two-way ANOVA test followed by the Tukey-test ( $\alpha = 0.05$ ).

**Results:** Administration of Celecoxib and Indomethacin prevented osteoclastogenesis signaling, osteoclast formation and periapical bone resorption, yet the effect of Celecoxib was sustained and more robust (p 0.05). Administration of selective and non-selective inhibitors of cyclooxygenase-2 enzyme differentially modulated expression of genes involved in bone metabolism. Celecoxib inhibited expression of mRNA for MMP-9 and calcitonin receptor and cathepsin K (p 0.05) while Indomethacin exerted no effect on MMP-9 and calcitonin receptor (p 0.05) or augmented cathepsin gene expression (p 0.05).

**Conclusions:** We found that selective COX-2 inhibitor Celecoxib reduced osteoclastogenic signaling and activity that dampened bone resorption in LPS-induced apical periodontitis with higher efficacy than the non-selective inhibitor Indomethacin.

## **Regenerative Endodontics in Necrotic Immature Tooth: A Myth or Reality**

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**Introduction:** Endodontic management of immature permanent teeth with necrotic pulps is a clinical problem for dental practitioners. Although it is feasible to perform apexification procedures, the long-term survival of these teeth is questionable. Regenerative endodontic procedures have emerged as a viable treatment alternative for these teeth.

**Case Report:** A 10-year-old male patient reported to our department with the chief complaint of pain in the upper front region of the jaw for 1 month. On clinical examination, Ellis Class IV fracture with intra oral swelling was seen in tooth 21. Radiographic Examination showed radiolucency involving enamel and dentin with immature root. Regenerative endodontic procedure was advised with platelet rich fibrin as a scaffold. Recall was done at an interval of 3 months, 6 months, and 1 year. Follow up at 1 year showed no pain, soft tissue swelling and signs of apical closure.

**Discussion:** There are several treatment options for a necrotic immature permanent tooth. Apexification is a procedure that promotes the formation of an apical barrier. But apexification with calcium hydroxide, bio dentine or MTA neither strengthens the root nor promotes further root development and thus roots remain thin and fragile. Regenerative endodontic treatment on the other hand has the advantage of further root development and reinforcement of dentinal walls by deposition of hard tissue.

**Conclusion:** Regenerative endodontic procedure is a feasible treatment option for necrotic young permanent teeth. Importantly, the vitality, immunity and sensibility of immature permanent teeth with necrotic pulps can be restored after regenerative endodontic therapy.

**Antimicrobial and Antibiofilm Effect of Phenolic Acids on Microorganisms of Endodontic Interest**

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**Background:** Phenolic acids are secondary metabolites produced by plants and have multiple essential functions in their physiology, such as in defense against pathogens and in response to environmental stress. In addition, they have therapeutic potential for the human organism, mainly as antimicrobial, antioxidant and anti-inflammatory agents. The aim of the study is to evaluate the antimicrobial activity of phenolic acids derived from cinnamic acid against bacteria of endodontic interest.

**Methods:** Cinnamic acid and its derivatives coumaric acid, caffeic acid, ferulic acid and synapic acid were evaluated by determining the Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) on *Streptococcus mutans*, *Lactobacillus casei*, *Actinomyces israelii*, *Enterococcus faecalis* and *Fusobacterium nucleatum*. The two best phenolic acids were selected to evaluate the effect on human multispecies biofilm in bovine dentinal tubules by confocal microscopy.

**Results:** All phenolic acids tested showed an inhibitory effect for, at least, one of the bacterial species tested, with MIC values ranging from 0.25 to 1 mg/mL. For multispecies biofilm, cinnamic acid led to a 79.7% reduction in the microorganisms, an effect 2x higher than that present by chlorhexidine (34.8%) and calcium hydroxide (35.8%). Caffeic acid had a similar effect to chlorhexidine and calcium hydroxide, reducing 35.9% of biofilms.

**Conclusion:** Cinnamic acid and its derivative compound caffeic acid showed antimicrobial activity on microorganisms related to endodontic infections in planktonic and biofilm conditions and could be used as antimicrobial agents for endodontic purposes.

### Recommendations for Managing Endodontic Emergencies during Covid-19 Outbreak

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**Background:** Management of endodontic emergencies has been particularly challenging during the COVID-19 outbreak due to the possible generation of airborne particles and aerosols. The aim of this report was to contribute to the practice of endodontics by proposing a general protocol for the management of emergencies showing the rationale for remote diagnosis, clinical procedures and use of personal protective equipment and barriers at the dental office, during the COVID-19 outbreak.

**Methods:** A review of the literature was conducted up to May 2020 on relevant institutional sites, aiming to retrieve the best updated evidence. The reporting considered the Reporting Tool for Practice Guidelines in Health Care (RIGHT) Statement.

**Results:** Recommendations from Cochrane Oral Health (CHO), the American Dental Association (ADA) and Centers for Disease Control and Prevention (CDCP) were included, besides the American Association of Endodontists (AAE) resources and scientific papers that addressed the issue.

**Conclusions:** The proposed protocol could contribute to the management of endodontic emergencies at the dental office during the COVID-19 outbreak.

**Reciprocating Instrumentation in Endodontic Treatment of Primary Molars - Success after 18 Months**

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**Background:** Reciprocating instrumentation is one of the great advances in modern Endodontics. Since endodontic treatment of primary teeth is a very often procedure, the use of these systems could be of relevance in Pediatric Dentistry. The purpose of this study was to compare the success rate of reciprocating instrumentation and manual instrumentation in endodontic treatment of primary molars after 18 months.

**Methods:** In this single-blind, parallel-grouped randomized clinical trial, a total of 151 primary molars (in 106 children) with endodontic treatment need were randomly assigned into two groups: manual instrumentation (MAN) or reciprocating instrumentation (RECIP). Treatments were performed in a single appointment, teeth were filled with Vitapex® paste and restored with Bulkfill® composite resin. Clinical and radiographic evaluations were performed by a third researcher, blind to the technique, after 6, 12 and 18 months. Comparisons between groups were made by logistic regression adjusted by the cluster (p0.05). Intention to treat analysis was used to obtain the survival rate and percentage of treatment failure.

**Results:** Success rate among MAN group (n=75) was 70.7% (n=53) and failure rate was 29.3% (n=22). Success rate among RECIP group (n=76) was 77.6% (n=59) and failure rate was 22.4% (n=17). We observed no significant difference between groups (p=0.333).

**Conclusion:** Endodontic treatment of primary molars with the use of reciprocating instrumentation is similar in terms of success when compared to conventional manual instrumentation.

## Management of Complicated Crown-Root Fracture with Pulp Exposure in Permanent Central Incisor: A Case Report

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**Introduction:** Crown-root fracture with pulp exposure is a fracture involving enamel, dentin, and cementum and exposing the pulp. According to the tooth's situation appropriate treatment could be planned. The principal aim of orthodontically extrusion of fractured tooth is to provide a supra-gingival tooth margin as it can be restored without impinging to periodontium and isolation faults.

**Case report:** 11 year-old boy patient attended our clinic 10 hours after the trauma incident. He fell at school and had a trauma in left permanent central incisor. In clinical examination, the pulp was exposed, palatal fragment was mobile and the fracture line reached to the root surface. In radiographic evaluation, there was no apical radiolucency or fracture on 2/3 apical region of root. The mobile fragment was removed and the root canal treatment was done in one visit. Because of the poor isolation for restoration, the orthodontic extrusion was planned for the traumatized tooth. The braces were applied in first visit as a splint. The permanent restoration was applied and then finally the retainer was bonded to palatal region of incisors. After clinical and radiographical evaluations done in 1,3,6,12,24 month follow-ups, there is no sign of radiolucency, resorption, discoloration, mobility or abscess.

**Discussion:** After orthodontically extrusion, the isolation can be ensured for the appropriate restoration. The disadvantages of the orthodontically extrusion are the esthetic concerns and long treatment period.

**Conclusion:** Orthodontic extrusion is a non-invasive and mostly reliable choice in crown-root fractures. Children also can tolerate the treatment and cooperate with the practitioner.



## **Volumetric Evaluation of Different Obturating Techniques in Primary Teeth using Cone-beam Computed Tomography**

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**Background:** The quality of the Obturation plays a significant role in the success of endodontic treatment. To date, various technologies have been used to evaluate the quality of Obturation, but all of them have their own limitations. In order to overcome those limitations, recent technological advances like Cone Beam Computed Tomography (CBCT) can be helpful. The purpose of the study to compare and evaluate the efficiency of different root canal Obturation techniques in primary teeth using CBCT.

**Methods:** In this In Vivo study, 80 primary root canals in 30 children between 4-9 years were selected and divided into four groups of 20 each. Obturation in group I was performed using the Endodontic pressure syringe technique, group II: Hand spreaders, group III: Lentulospirals mounted on slow speed hand piece and group IV: Insulin syringe. The effectiveness of the quality of Obturation was evaluated using a CBCT scan.

**Results:** Group-I showed the highest number of optimally filled canals 75%, followed by group II (65%) and group III (70%). The highest number of under filled canals was seen in group IV (35%). The highest number of overfilled canals seen in group III (20%). The minimum number of voids was seen in all the four groups, which is statistically insignificant [ $\geq 0.05$ ].

**Conclusion:** Endodontic pressure syringe technique reported the highest number of optimally filled root canals. The insulin syringe showed the least number of optimally filled root canals. The presence of the number of voids was statistically insignificant.

### **Triple Antibiotic Paste (TAP) Versus Double Antibiotic Paste (DAP) as Intracanal Medicament in Revascularisation of Immature Nonvital Teeth: A Case Report**

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**Introduction:** Pulp revascularisation has emerged as an alternative treatment for necrotic immature tooth. Infection control is crucial for the success of pulp revascularization. Triple antibiotic paste (TAP) consisting of metronidazole, ciprofloxacin and minocycline is the medication most widely used. Although TAP has many positive attributes, several papers have reported visible crown discoloration of developing teeth due to minocycline.

**Case Presentation:** A 10-year-old Malay girl presented with severe spontaneous pain with buccal abscess on tooth 45. Clinical diagnosis was acute apical periodontitis of tooth 45. Clinically, tooth 45 and 35 presented with fractured occlusal dens evaginatus. Radiographically, both teeth showed two-thirds root development, thin dentinal walls, wide open apex with widening of periodontal ligament (PDL) space and presence of periapical radiolucencies. Two-visit revascularisation was done with double antibiotic paste (DAP) (ciprofloxacin and metronidazole) used on 35, and TAP used on 45 as intracanal medicament. At 1-year review, both teeth showed thickening of dentinal walls, increased root length, positive apical closure, and positive response to electric pulp test (EPT).

**Discussion:** The infection of the root canal system is polymicrobial, hence a combination of drugs would be needed to treat the diverse flora. The most popular drug of choice is a combination of metronidazole, ciprofloxacin and minocycline. None of these drugs resulted in complete elimination of bacteria when tried individually. However, in combination, these drugs are able to consistently eradicate all bacteria.

**Conclusion:** DAP can be used to replace TAP as intracanal medicament in revascularisation of non-vital immature teeth to avoid crown discoloration.

### A Modernist Intervention to Regenerative Endodontics

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**Introduction:** Management of necrotic young permanent teeth poses greater endodontic challenge to the clinicians. Regenerative endodontics involves the interplay of three key elements of tissue engineering—stem cells, scaffolds, and growth factors. Along with this, efficient root canal disinfection plays a major role. These procedures rely heavily on root canal disinfection. Traditionally used irrigants and medicaments were reported to show drawbacks. Therefore, the purpose of the report is to present the results of laser assisted disinfection in regenerative endodontic cases.

**Case Report:** Case series describes about the management of four cases of necrotic young permanent teeth. Cases were treated using laser assisted disinfection method. Platelet rich fibrin or blood clot was used as a scaffold and coronal seal was given using Mineral trioxide aggregate and final restoration was placed.

**Discussion:** This report of pulp regeneration showed that laser assisted disinfection combined with PRF or blood clot scaffold systems lead to apical closure and increasing radicular thickness in necrotic young permanent teeth. Laser assisted disinfection has been confirmed as an effective adjunct for root canal disinfection. Several studies have shown the benefit of laser assisted disinfection and reduction of bacterial load in infected root canals.

**Conclusion:** This is the rarest case series which documents the efficacy of a new disinfection protocol in pulp regeneration which showed consistent and successful results.

### **Comparing the Antibacterial Efficacy of Camellia Sinensis and Chlorhexidine Gluconate as Root Canal Irrigants in Primary Teeth Contaminated with Enterococcus faecalis: In-Vitro Study**

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**Background:** Chlorhexidine gluconate is an effective antimicrobial irrigant. However, to counter its side effects, herbal alternatives were introduced. Green tea exhibits antibacterial activity on *Enterococcus faecalis*. The aim of the present study was to compare the antimicrobial efficacy of 20% *Camellia sinensis* leaves extract versus 2% Chlorhexidine gluconate as root canal irrigants in roots of primary teeth contaminated with *Enterococcus faecalis*.

**Methods:** 50 primary roots were randomly distributed among two experimental groups, a positive control and a negative control groups:

1. 30 roots contaminated with *Enterococcus faecalis*, 15 of them irrigated with 2% Chlorhexidine gluconate and 15 with 20% Green tea leaves extract.
2. (Positive control): 15 roots contaminated with *Enterococcus faecalis* and irrigated with sterile saline.
3. (Negative control): 5 roots neither contaminated nor irrigated.

Two sterile absorbent paper points were used to absorb the irrigation fluid from each root and transferred to a test tube containing 1 ml of saline. Colony forming units of *Enterococcus faecalis* per 1 ml were counted.

**Results:** ANOVA test was significant. Positive control group had the highest (Mean±SD) followed by green tea leaves extract group. Chlorhexidine had the lowest (Mean±SD).

Pairwise comparisons showed that there was a significant difference between the means of CHX and the positive control groups, also between the means of green tea leaves extract and the positive control groups.

**Conclusion:** 20% green tea leaves extract and 2% Chlorhexidine gluconate irrigation solutions showed an antibacterial effect against *Enterococcus faecalis*. 2% Chlorhexidine gluconate showed superior efficacy against *E. faecalis*.

## Treatment of a Primary Molar Utilizing Lesion Sterilization and Tissue Repair: A Case Report

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**Introduction:** Endodontic non-instrumentation therapy has gained popularity because it is a minimal intervention approach that uses a mixture of antibiotics in order to disinfect the root canals. This case report describes the treatment and 36-month follow-up of a deciduous necrotic molar using the technique “Lesion Sterilization and Tissue Repair” (LSTR) modified.

**Case report:** A 5-year-old female patient sought dental care complaining of pain in the region of tooth 85. Clinical oral examination revealed the presence of caries with pulp involvement in tooth 85. In the preoperative period (T1), the patient had a fistula, abscess and edema and had no pain. Endodontic treatment was performed under isolation, following the LSTR technique with triple antibiotic paste. At follow-up, T2 (one month), T3 (6 months), T4 (12 months) and T5 (36 months) no changes in clinical symptoms were evident. From the radiographic aspects, at T1 the presence of a large inter-radicular lesion was verified and at the end of the follow-up in T4 and T5, complete bone regeneration was observed in the region.

**Discussion:** Due to the high antibacterial efficacy of the paste used in the technique, it may be suitable in cases of poor prognosis, in addition to being performed in a shorter operative time, which can be useful in the treatment of children with negative behavior.

**Conclusion:** The LSTR technique showed satisfactory results in the pulpectomy of a primary necrotic molar.

**Revascularization: Treatment of Choice in Non-Vital Tooth: A Case Report**

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**Introduction:** Pulp necrosis of young permanent teeth will ultimately lead to thin and fragile canal walls and open root apex. Recently it has been shown that necrotic immature teeth can be treated by regeneration which is dependent on the ability of residual pulp and apical stem cells to differentiate and allows root growth, thickening of dentinal walls and closure of open apex. This case report describes the treatment of necrotic immature tooth by pulp revascularization.

**Case report:** Patient reported with history of trauma three years ago. Radiographs revealed immature apices associated with maxillary central incisors. Local anaesthesia was administered and rubber dam was placed, and a conventional endodontic access opening was made, and the canals were irrigated copiously with 5.25% sodium hypochlorite solution alternatively with normal saline solution, and minimal instrumentation. Triple antibiotic paste was placed in the root canal. The patient was recalled after 1 week and intracanal medicament was flushed with 5.25% sodium hypochlorite solution and EDTA. Revascularization was performed in right central incisor. Patient was recalled after 3, 6 and 12 months respectively for clinical and radiological evaluation that showed appreciable thickening and elongation of dentinal walls of the central incisor along with root end closure and elongation and healing of periapical radiolucency.

**Discussion:** Advantage is obturation is not required that eliminates the chance for root fracture during lateral condensation. Disadvantage is susceptibility to further pulp disease and may require retreatment.

**Conclusion:** For necrotic immature teeth, revascularization is a desirable alternative to apexification and shows both good short-term and long-term prognosis.

**Composite Endocrown Restoration of Excessively Mutilated Endodontically Treated Teeth**

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**Introduction:** Restoration of endodontically treated teeth with excessive crown damage is extremely challenging. The success of the coronal restoration is directly related to the clinical success of the endodontically treated tooth. Conventional post and core restorations have some disadvantages such as the preparation of the healthy dental tissues as well as post and root fractures. For this reason, more conservative treatment alternatives have been suggested. The aim of this report is to present a case with endocrown restoration as an alternative treatment method for the restoration of badly mutilated endodontically treated teeth.

**Case report:** A 13 years old male came to our clinic accompanied by his parents with a complaint of pain in the lower left posterior area. On examination, tooth 36 with excessive substance loss was found to be the cause. After performing root canal treatment, composite endocrown was planned for coronal restoration. The tooth was prepared and impression was taken. After pouring the model, composite restoration was made. On the second visit, endocrown restoration was cemented using glass ionomer cement.

**Discussion:** In this case, after a 1-year follow up, endocrown restoration was found to be aesthetically and functionally successful. Endocrown restorations are recommended as an alternative to conventional post and core restorations especially in teeth with short clinical crowns where the ferrule effect is inadequate.

**Conclusion:** Endocrown restorations conforming to minimal invasive principles can be used as an alternative treatment option to conventional post and core restorations in restoring badly mutilated endodontically treated teeth.

## **A Comparative Clinical Evaluation of Rotary Versus Manual Files for Instrumentation in Primary Teeth Pulpectomies- A Two Year Follow-up Study**

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**Background:** Pediatric endodontics has seen great developments since the introduction of Nickel Titanium (Ni-Ti) files. Many studies have assessed the immediate outcome using the rotary file systems. There is paucity of published research on primary teeth pulpectomy comparing different rotary file systems and their effect on success after two years.

**Methods:** A total of 150 primary molars were selected from children aged 4-6 years. These teeth were divided into 3 groups of 50 teeth each. In groups 1, 2 and 3, cleaning and shaping was done using Kedo-S files, HERO shaper files and manual Ni-Ti K-files, respectively. Obturation was done using zinc oxide eugenol cement carried with engine driven lentulo spiral. Instrumentation and obturation time were recorded. Radiographic assessment regarding the quality of root filling was done immediately post-obturation. Pulpectomized teeth were evaluated clinically and radiographically for a period two years.

**Results:** The mean instrumentation and obturation time for groups 1, 2 and 3, were  $14.55 \pm 2.89$  min and  $8.11 \pm 1.7$  min,  $14.93 \pm 3.51$  min and  $7.93 \pm 1.3$  min and  $29.00 \pm 2.0$  min and  $9.64 \pm 1.76$  min, respectively. The mean difference in quality of obturation was not statistically significant between two the rotary systems ( $p=0.16$ ). However, it was significant between rotary systems and manual files ( $p=0.001$ ). At two years, the clinical success was 100% and the radiological success were 95.3%, 97.9% and 89.5% in groups 1, 2, and 3, respectively.

**Conclusion:** Rotary file systems took significantly less instrumentation and obturation time than manual files. There was no significant difference in quality of obturation or in the success rates after two years.



## Management of an Immature Necrotic Permanent Premolar with Hidden Caries: A Case Report

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**Introduction:** The aim of this case report was to present successful management of #35 with open-apex and large periapical-lesion.

**Case report:** 10-years-old girl complained of painful swelling on the mucosa over the #35. Visual-tactile examination revealed a caries confined to enamel and the tooth had a sinus-tract. In addition, it did not respond to thermal-tests as well as the presented hypersensitive response to percussion and palpation. Radiographic examination showed deep-caries extending towards pulp, open-apex and large periapical radiolucency. A treatment-plan was devised that consisted of endodontic management with one-step apexification using MTA apical-plug and esthetic restoration for the tooth.

Chemo-mechanical preparation was performed using rotary/hand-files and irrigation solutions. Calcium-hydroxide was used for intracanal dressing for one-month. Then, an apical plug of MTA was applied and the remaining pulp space was then filled with gutta-perchas and sealer using the lateral and vertical condensation-techniques. Restoration was completed by hybrid-composite-material with direct-technique. At the 12-months reevaluation, patient was asymptomatic, the tooth had remained functional, and radiographic assessment showed significant osseous-healing of the lesion.

**Discussion:** Apexification is a method to induce a calcific barrier in a root of immature tooth with a necrotic pulp. The most promising alternative to calcium-hydroxide is MTA. Reduction in treatment time, creating a good seal and biocompatibility, no adverse effect on the mechanical properties of root dentin are the advantages of this material. Based on the results of this case, the nonsurgical management of teeth with necrotic pulps and incomplete apex-formation with MTA was successful.

**Conclusion:** It can be concluded that apexification with MTA is a strong alternative to conventional apexification technique.

### Computed Tomographic Evaluation of Kedo S Paediatric and Mtwo Rotary File in Primary Teeth

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**Background:** The intention of root canal preparation is to reduce infected content and create a root canal shape allowing for a well condensed root filling. Therefore, it is not necessary to remove excessive dentine for successful root canal preparation and concern must be taken not to over instrument as perforations can occur in the thin dentinal walls of primary molars. This study was done to evaluate the time preparation and dentine removal of the Kedo S Paediatric and Mtwo rotary instrumentation in primary teeth.

**Methods:** Fifty extracted mandibular primary first molars were selected and divided into two groups. Using Cone beam computed tomography (CBCT) the teeth were scanned before instrumentation. Access opening was done, and the teeth were prepared using Kedo S Paediatric files for Group I. In Mtwo rotary files the instrumentation was done up to 20 size file (0.06% taper) and simultaneously the instrumentation time was recorded. The instrumented teeth were once again scanned, and the images were compared with the images of the uninstrumented canals

**Results:** The mean instrumentation time in Kedo S Paediatric rotary files was 53.40 seconds and in Mtwo rotary files was 192.8 seconds. Levene`s Test for Equality of Variances showed highly statistically significant difference (P 0.05). There were no statistically significant differences (P 0.05) in dentinal removal between Kedo S Paediatric files and Mtwo rotary files .

**Conclusion:** Kedo S paediatric systems was found to be faster and shows less dentinal removal hence it can be recommended for shaping the root canals of primary teeth.

### **Evaluation of Canal Transportation and Centering Ability of Kedo S Paediatric and Mtwo Rotary File in Primary Teeth using Cone Beam Computed Tomography**

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**Background:** One of the purposes of root canal preparation is to clean and shape the root canal system while maintaining the original configuration. Therefore, it is significant to keep the instruments centered to provide a correct enlargement, without disproportionate weakening of the root structure.

**Methods:** A total of 50 extracted mandibular primary first molars was collected. Canals were divided randomly into two groups of 25 teeth each. Group I: Kedo S Paediatric files, Group II: M two rotary files. Three regions from apical, mid-root, and coronal levels of the canal were recorded. All the teeth were scanned before and after instrumentation by using Cone beam computed tomography (CBCT).

**Results:** The mean values were compared between different study groups, and the P-value was calculated by T-test. The Levene's Test was used to significance between two groups. Kedo S Paediatric files and Mtwo files shows less canal transportation and better centering ability in all three regions. Both the files had no statistically significant (P 0.05) in maintaining the canal centering ability

**Conclusion:** The Kedo S Paediatric and Mtwo rotary systems showed similar canal centering abilities in the preparation of Primary first molars.

## A Novel Approach for Instant Quantification of Bacterial Load during Root Canal Therapy

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**Background:** The goal of root canal therapy is to eliminate the pathogenicity of bacteria in the root canal system of teeth. Treatment approaches include chemico-mechanical cleaning to prevent microorganisms from infecting or re-infecting root canals and periradicular tissue after treatment. Therefore, complete eradication of microorganisms is essential for successful RCT. The current methods to evaluate persistent presence of bacteria after therapy is not widely. In the past, presence of infection was assessed on the basis of clinical evaluation. Presently ATP assay and Fluorescence staining are used which are expensive and technique sensitive. We introduce QLF in the field of endodontics.

**Methods:** Root canal sample was collected from the patient's infected tooth with history of pain and swelling. Exudate samples were taken using sterile paper points immediately after access opening at the orifice, after extirpation in the canal and after irrigation. Intra canal medicament were given and recalled after one week, again exudate sample were collected. QLF images were taken under QLF-D Biluminator™ for all samples.

**Result:** The analysis was done using QA3 version 1.26 Software. The extent of redness in the blue light image depicted the bacterial load instantly and the analysis depicted the reduction of the Mean Bacterial Load on the basis of SPS scoring objectively.

**Conclusion:** It is possible to state that QLF is highly precise and reliable tool for the instant detection of the bacterial load in the root canal system. Our concept of QLF in endodontics instantly help us to visualize the bacterial load before and after treatment.

### Total Pulpotomy in Young Permanent Molar Tooth with Deep Caries

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**Introduction:** Keeping the pulp of young permanent teeth vital is very important until the root development is over. The aim of this treatment is to ensure the root development completed.

**Case Report:** A 9-year-old patient applied to our clinic with complaints of dental caries. Deep dentin caries was detected in the lower right 1st molar tooth. In the clinical examination, it was determined that there was no percussion sensitivity and spontaneous pain but cold sensitivity. On radiography, the root area was healthy. A pulp perforation of more than 2 mm occurred during the procedure. Coronal pulp tissue was removed, the cavity was cleaned with chlorhexidine, and after bleeding was controlled, the pulp was covered with MTA. A temporary restoration was done with glass ionomer cement. 4 weeks later, no symptoms were observed in the tooth and permanent restoration was performed with resin composite. On the 9th and 12th-month control radiographs, the root development was seen to be continued.

**Discussion:** Total pulpotomy is a preferred method for young permanent teeth with vital root pulp in which the pulp is exposed due to deep caries or trauma. Total pulpotomy can be done if the inflammation is spread to the depths of the coronal pulp, the perforation area is large or more than one, the bleeding can be controlled during the procedure, and the tooth is radiographically healthy.

**Conclusion:** Total pulpotomy is a successful method for the treatment of young permanent teeth that have vital root pulp which are affected by deep caries or trauma.

**Endodontic Treatment in Primary Teeth with Antibiotic Paste: A 3-Year Follow-Up Case Report**

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**Introduction:** The endodontic treatment is an alternative to avoid loss of teeth with pulp involvement. The objective of this study is to report a case of a primary tooth treated endodontically with antibiotic paste and with 3 years of follow-up.

**Case Report:** A four-year-old male patient came to the dental office with dental pain. After clinical and radiographic examination, a carious lesion with pulp involvement was found on tooth 52. After anesthesia and rubber dam isolation, surgical access to the pulp and irrigation with saline solution 0.9% were performed. Chloramphenicol, tetracycline and zinc oxide were handled with eugenol (CTZ paste). The paste was inserted with a sharp explorer at the entrance of root canal and the cavity was sealed with a layer of gutta-percha stick. Tooth was restored with resin-modified glass ionomer cement. Follow-up sessions of 6, 12 and 36 months showed clinical and radiographic success.

**Discussion:** The technique adopted in this case does not require root canals instrumentation. It is believed that the antibiotic paste used sterilize the infected and necrotic pulp canals. At the same time, the technique consumes less clinical time and, consequently, causes less discomfort to the patient.

**Conclusion:** Endodontic treatment with antibiotic paste showed clinical and radiographic success in anterior primary tooth after 36 months and constitutes an option for the dentist.

**True Life is Lived when Tiny Changes Occur....****Revascularization of Necrotic Immature Permanent Mandibular Second Molar**

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**Introduction:** The treatment of necrotic young permanent teeth with an immature open apex still presents multiple challenges in pediatric dentistry. Traditional methods of apexification are very cumbersome and time consuming and leave us with a very compromised tooth in the oral cavity. Revascularization in such cases, not only provides apical closure but also increases the dentine wall thickness thereby leaving a more natural tooth in the child's mouth. Here is a case of revascularization in the second permanent molar which had become non vital due to periapical infection.

**Case report:** An 11 ½ year old male child reported with a nonvital immature second permanent molar . A revascularization procedure was performed after evaluating all possible treatment options. A good coronal seal was ensured using MTA and a post endodontic composite restoration was done. At 3 and 6 months, not only did the periapical pathology show signs of healing but also there was noticeable root completion.

**Discussion:** The primary goal of regenerative endodontic procedures is healing of apical periodontitis as stated in the revised AAE (American academy of endodontics) guidelines (July 2013). The success of revascularization therapy depends on efficient disinfection of the root canal system followed but a tight coronal seal, both of which were achieved in this case.

**Conclusion:** For necrotic immature teeth, revascularization is a desirable alternative to apexification and shows better prognosis.

**Full Pulpotomy with MTA of a Young Permanent Teeth: A Case Report**

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**Introduction:** Full pulpotomy is a treatment approach for the management of inflamed dental pulps exposed due to caries or trauma, especially for young permanent teeth. With full pulpotomy, removing the inflamed coronal pulp and covering the remaining radicular pulp with a biomaterial, promotes the healing of the radicular pulp. Due to this technique we can maintain the pulp vitality and ensure that the root development continues with the formation of hard tissue barrier on the exposed pulp surface.

**Case Report:** A 12-year old female patient with exposed pulp due to caries in left maxillary first permanent molar was treated with full pulpotomy with MTA. Clinical and radiographic examinations were performed at first, 3rd, 6th, 12th months. At the end of 12th month tooth was asymptomatic and showed no clinical and radiographic signs of infection or inflammation.

**Discussion:** Root canal treatment for teeth with exposed pulp can be considered for prophylactic purposes but it can't maintain vitality. Pulpotomy is a vital pulp therapy procedure and it is more favorable than root canal treatment. With the development of biomaterials the success rate of this treatment method has increased. But, if the procedure fails it is necessary to remove MTA and perform root canal treatment. Therefore choosing the right case is important for long term success.

**Conclusion:** Full pulpotomy with MTA showed clinical and radiographic success after one year. There were no clinical signs and symptoms of irreversible pulpitis for the treated tooth.



## The Retreatment Procedure of a Permanent Premolar Tooth which Has Failed Regenerative Endodontic Therapy

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**Introduction:** Regenerative endodontic therapy (RET) is a treatment procedure that promotes the apexogenesis of a necrotic-immature-permanent-tooth and MTA has gained widespread popularity for this procedure. When a successful treatment cannot be provided by RET, according to the AAE guidelines, apical closure with MTA can be planned. The aim of this case-report is to present the treatment procedure for a premolar in which RET failed and the tooth had a large apical lesion and fistula.

**Case report:** A 9-year-old girl referred to the clinic with pain at her #45. Taking into consideration the incomplete root development with wide-open apices, RET was considered. Regeneration protocol that used irrigation, calcium-hydroxide placed as a medication, induction of apical bleeding, and coronal sealing with MTA was applied. Approximately 12-months after treatment pain, fistula formation, and large apical lesion were again observed. Therefore, apical closure with MTA plug was scheduled. After preparing the access cavity, the coronal MTA was removed, root canal was prepared, irrigated, and calcium-hydroxide was placed. After 3-weeks MTA plug was placed in the apical part of the canal. After 2-days, the coronal part was filled with gutta-percha and sealer. At the 12-months re-evaluation, the patient was asymptomatic, the tooth had remained functional and radiographic assessment showed significant osseous-healing of the lesion.

**Discussion:** According to the guidelines, an alternative treatment plan is required in cases that do not meet the essential requirements of a successful treatment.

**Conclusion:** Immature-necrotic-teeth can be successfully treated by RETs in the short-term, but the long-term outcome is still missing.

## **Regenerative Treatment of an Immature Two Times Traumatized Tooth with Platelet Rich Fibrin: A Case Report**

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**Introduction:** Regenerative endodontic treatment is a successful method with the potential to heal necrotic pulp that may be beneficial for the root development of immature permanent teeth. The aim of this report is to present a patient whose treatment was successful despite being traumatized for the second time during treatment.

**Case report:** A seven-year-old male patient was referred to our clinic with necrosis due to trauma in the right upper central incisor. The canal was minimally instrumented and effectively irrigated with 20ml of 2.5% NaOCl. The canal was dried and Ca(OH)<sub>2</sub> paste was placed inside the root. On the same day, the patient referred to clinic with a root crack in the coronal region caused by second trauma. Ca(OH)<sub>2</sub> paste was renewed but wasn't required to splint due to absence of mobility. To avoid leakage from the cracked area, that area was also sealed with MTA. After 21 days, Ca(OH)<sub>2</sub> was removed, the Platelet Rich Fibrin (PRF) was placed into the canal till the level of cemento-enamel junction and 3mm of white MTA was placed directly over the PRF clot. A week later, for the setting of MTA, the patient was recalled and tooth was sealed with zinc phosphate cement and composite restoration. The patient was reviewed radiographically and clinically at 3,6,12,18 months.

**Discussion:** It was observed that the tooth was asymptomatic, the canal wall thickened and the root elongated.

**Conclusion:** Based on the 18-month results of this case, it appears that PRF supported treatment is a successful method for regeneration of vital tissues in necrotic teeth.

**Clinical and Radiological Evaluation of Amputation Therapy Applied to Permanent Molar Teeth**

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**Background:** CEM(Calcium Enriched Mixture) is a material whose clinical success has been proved with case reports in last recent years. This study aimed to compare its long term success with MTA and Ca(OH)<sub>2</sub>, which are the most used amputation materials.

**Methods:** Coronal amputation was performed on 60 permanent molar with irreversible pulpitis of 54 healthy children between the ages of 6-15 who were determined in accordance with power analysis. Zinc phosphate cement was placed on the amputation material, and as a final restoration, it was restored with composite/amalgam filling or stainless steel crowns. The successes of CEM, MTA and Ca(OH)<sub>2</sub> were compared in detail with clinical and radiographic controls performed 1,3,6,9 and 12 months. Clinically; the response to the electric pulp test, the presence of pain, ankylosis, percussion/palpation sensitivity, mobility or fistula, tooth discoloration, the state of the final restoration were evaluated. In periapical radiographs taken with parallel technique; pulp obliteration, internal/external root resorption increase/decrease in lamina dura width and root development were evaluated. Teeth meeting all criteria were considered successful.

**Results:** Of the teeth included in the study, 48 were with open and 12 with closed apex. At the 12 month check; the success rate is 84.21% in CEM Group, 78,26% in MTA Group, 66.7% in Ca(OH)<sub>2</sub> Group. The follow-up visits of the patients for 15,18, 24 and 36 months also continues.

**Conclusion:** In our study, we found CEM more successful in permanent tooth amputation, clinical and radiographic controls than existing materials.

### Effect of Different Root Filling Materials for Primary Teeth on Residual Antimicrobial Activity of 2% Chlorhexidine

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**Background:** The aim of this study was to evaluate the effect of different root filling materials for primary teeth on residual activity of 2% chlorhexidine (CHX) used as final irrigant.

**Methods:** One hundred sections of standardized bovine teeth were treated with 2% CHX and divided in four groups. Groups E1, E2 and E3 were respectively obturated with Vitapex<sup>®</sup>, ZOE<sup>®</sup> and Calen<sup>®</sup>. The NO group was not filled. After incubation for 1 and 30 days, the sealers were removed and the dentin chips were collected. Quantitative analysis of residual CHX was performed by spectrophotometry. The quantification of antimicrobial activity was made by time kill and broth micro-dilution methods.

**Results:** After 1 day and 30 days storage, CHX concentrations were detected in all dentin extracts, which absorbance readings remained above 0.71 and 0.62AU. The NO group showed an antibacterial performance better than the other groups, however without significant difference when compared to the Vitapex<sup>®</sup> ( $p=0,28/p=0,35$ ). For the NO group, the results were 93,18% and 83,05% of bacteria reduction, while for the filled groups, the antimicrobial efficacies were E1(58-54%), E2(45-34%) and E3(36-32%), after 1 and 30 days, respectively. It was observed an antibacterial activity progression with contact time.

**Conclusions:** Regardless of the root filling materials used, it was possible to identify active concentrations of residual CHX against *E. faecalis* in all groups tested in the experiment, in both periods evaluated. However, the results suggest a greater effect of Vitapex<sup>®</sup> group residual CHX compared to the ZOE<sup>®</sup> and Calen<sup>®</sup> groups, in reducing the bacterial count.

## N-Acetylcysteine Augments the Odontoblastic Differentiation of Stem Cells from Human Exfoliated Deciduous Tooth by Triggering the Expressions DSPP and DMP-1 Genes

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**Background:** N-acetylcysteine (NAC) regulates the healthy propagation of dental stem cells in vitro. Its effects on the differentiation of dental pulp stem cells from exfoliated deciduous tooth (SHEDs) remain unidentified. This investigation intended to study the effects of NAC on the propagation and differentiation of SHEDs.

**Methods:** SHEDs were isolated by explant culture method and characterized for stem cell properties by flow cytometry. MTT assay and CCK-8 assay were used to examine the viability and proliferation of the SHEDs. The effects of NAC-induced osteo/odontoblastic differentiation of SHEDs were determined by functional staining for mineralization, and the gene expression of osteo/odontoblastic transcription factors and proteins was evaluated by qRT-PCR analyses. Protein levels of COL1, DSPP, and DMP-1 were enumerated by Western blot method to assess osteo/odontogenic differentiation.

**Results:** SHEDs presented mesenchymal stem cell-like characteristics. Low to moderately high doses of NAC (0.5-10 mM) were shown to be in concurrence with viability and metabolic activity of SHEDs. None of the concentrations of NAC up to 2.5 mM affected cell proliferation. NAC treatment (2.5 mM) showed higher mineralization and considerably increased gene expression levels of RUNX2, COL1A1, DSPP, and DMP1. NAC significantly increased the protein expression of odontoblast-related matrix proteins COL1, DSPP and DMP-1.

**Conclusions:** This study explores that NAC can encourage mineralization of SHEDs and to differentiate into the odontoblastic lineage. The results propose that NAC could have a significant pharmacological role in activating and enhancing odontogenic differentiation of dental stem cells and possibly will deliver innovative intuitions into the regenerative dentistry.

Dental Trauma, Endodontics, Restorative Dentistry

## **MTA Pulpotomy and Putty Index Technique for Management of Complicated Crown Fractures in Young Permanent Incisors: A CASE Report**

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**Introduction:** Management Complicated crown fracture in a young permanent tooth with an open apex is indeed a challenge to the practitioner. A procedure that will maintain the vitality of the tooth, promote root development, followed by a definitive restoration that will not only restore the form of the tooth but also the confidence of the child is mandatory. This case report describes the successful rehabilitation of such a case with follow up

**Case report:** A 11 year old boy reported with fractured central incisors, the day after trauma. The left incisor showed a pin point exposure, while the right showed no evidence of exposure. Both had open apices. An MTA pulpotomy to promote apexogenesis was done on 21 and an alginate impression of the patient was made. A wax mockup of incisors to the desired form was achieved on the cast and a putty index was made. At the next appointment a composite restoration was done for both the incisors using this index.

**Discussion:** Success depends on the time at which treatment is initiated after trauma and the material used. Also, due to the inability to achieve isolation immediately post trauma; putty index technique comes handy, where a good form can be established for the tooth on the cast and the patient can be called later for rehabilitation when hemostasis and isolation can be achieved.

**Conclusion:** MTA pulpotomy followed by putty index technique for restoration is a good option for managing traumatized young permanent teeth with crown root fractures.

**Biomimetic Nanohydroxyapatite- The Endodontic Prodigy**

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**Background:** A young permanent tooth presenting with complicated crown fractures and immature root possess a considerable endodontic challenge in achieving a hermetic seal. Various materials and techniques have been proposed over the years to overcome this hitch, but only to a varying amount of success. Nanohydroxyapatite, the bioceramic with excellent biocompatibility and proven bioactivity can be the next logical progression in the list of materials to induce apexogenesis in a reliable manner in such immature teeth. The aim of this study is to evaluate clinically and radiographically, the efficiency of biomimetic nanohydroxyapatite in comparison with calcium hydroxide in inducing maturogenesis in immature permanent teeth with complicated crown fractures .

**Methods:** 30 patients with complicated crown fractures in immature permanent central incisors were equally divided into nanohydroxyapatite group and calcium hydroxide group. Each tooth was treated with cervical pulpotomy and the radicular pulp stump was covered with the one of the experimental materials depending on the group they belong. Clinical and radiographic evaluation was done at 3, 6, 12, 18 and 24 months.

**Results:** At the end of the 2 year follow up period, statistically significant clinical and radiographic success in terms of maturogenesis, maintenance of vitality, absence of clinical and radiographic pathologies was better seen in the teeth treated with nanohydroxyapatite rather than with calcium hydroxide

**Conclusion:** Based on the ability of nanohydroxyapatite to induce maturogenesis, favorable clinical and radiographic outcomes, the material might be considered as an alternative material for maturogenesis

## One-Year Follow-up of Primary Second Molars with Permanent Missing Teeth with OrthoMTA Overflowing Material

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**Introduction:** Agenesis refers to fewer than normal numbers of teeth in the mouth as a result of the absence of one or more teeth for any reason. When root canal treatment is required for primary second molar without permanent successors, difficulties are faced due to the physiological-morphological anatomy of primary teeth. The aim of this case series was to report the follow-up of the root canal-treated teeth with OrthoMTA and the effect of the material overflowing during treatment on periodontium.

**Case report:** The root canal treatment of four pulp-infected lower primary second molars without permanent successors was performed with OrthoMTA, and on the radiograph taken immediately after the treatment, the material was found to be overflowed. The teeth were followed clinically and radiographically for 12 months. The clinical-radiographic success of the treatment, the change in the size of the overflowing canal filling material, and the effect of overflowing filling material on the success of the treatment were evaluated.

It was observed that while the overflowing canal filling material decreased in time in two patients, it remained stable in one patient. And the other patient was performed apical surgery due to increased lesion sizes. At the end of one-year follow-up all teeth were observed asymptotically.

**Discussion:** It was demonstrated that the success of the treatment was not affected in three patients with overflowing material.

**Conclusion:** Long-term follow-up is needed to reveal the effect of direct contact of OrthoMTA material overflowing after canal treatment on periodontium.



### External Cervical Resorption in the Vital Tooth: An Incidental Finding

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**Introduction:** The complex and aggressive nature of external cervical resorption (ECR) may predispose to misdiagnosis and unnecessary loss of tooth structure. Despite early detection being essential to successful outcomes, ECR is often an incidental finding. Treatment poses a clinical challenge, particularly during orthodontic therapy, and options are primarily dependent on extent of resorption.

**Case report:** A 14-year-old male undergoing fixed orthodontic treatment was referred following incidental finding of ECR of his UL2. His medical history was unremarkable and there was no history of dental trauma. UL2 was vital and PA radiographs revealed ECR Heithersay Class II. Orthodontic and endodontic input was obtained and orthodontic forces were removed awaiting Cone Beam Computed Tomography (CBCT), which revealed a Patel Class 2(Bd) defect and mild apical resorption. Treatment options included surgical endodontic therapy and tooth extraction. However, as resorption was discreet from the pulp canal, continued radiographic monitoring was justified. Continuation of light orthodontic forces was recommended.

**Discussion:** Vital teeth undergoing external cervical resorption may be protected from pulpal perforation by the pericanalar resorption-resistant sheet (PRRS). Scope for continuation of orthodontic forces and effective treatment of such teeth relies on accurate diagnosis. CBCT has shown to be a reliable diagnostic tool for assessing ECR, allowing visualization of extent of resorption.

**Conclusion:** This case highlights the use of CBCT as a diagnostic adjunct for a vital tooth undergoing ECR, which is unique from other varieties of external resorption. The importance of a multidisciplinary approach in effective treatment planning of complex cases is also emphasised.

**Effect of Four Irrigating Solutions on Bond Strength of Obturating Materials: An In-Vitro Study**Shweta Chaudhary, Kimaya Kade*Pediatric and Preventive Dentistry, IAPD20-Virtual, Pune, Maharashtra, India*

**Background:** Success in endodontic therapy depends on debridement of the root canal system through the use of instruments and effective irrigating solutions. The aim of instrumentation and irrigation is to prepare a debris-free canal for subsequent obturation.

**Aim:** Comparison of the effect of different irrigating solutions on Bond Strength of obturating materials: An in-vitro study.

**Method:** After ethical committee approval, healthy sound caries free premolars are included. Forty teeth were divided into 4 groups, Azadirachta indica, Curcuma longa, MTDA and Sodium Hypochlorite as irrigating solution. Roots were vertically placed in the center of blocks of resin. Sectioning was carried out Horizontally. Three root sections of 2 mm thickness at 3, 7 and 11 mm from the apex were obtained. Each piece was further subjected to a compressive load via a universal testing machine. the push-out bond strength was calculated. By using one-way ANOVA test followed by post hoc comparison of bond strength among four study groups were evaluated.

**Results:** MTAD has highest pushout bond strength among all 4.54 mpa. Significant p value is 0.005 in the middle region. sodium hypochlorite has highest mean value than others. Pairwise comparison is done in coronal region. No significant results were found.

**Conclusion:** We can attempt to replace Sodium hypochlorite with herbal irrigating materials which have comparable efficacy with lesser adverse effects. These natural alternatives like Azadirachta Indica and Curcuma longa may prove to be more inert irrigating solutions.

**Brassia Oleracea: An Instant Natural Indicator of the Moisture and the pH of the Root Canal**

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**Background:** It is established that a root canal must be perfectly dry before any filling can be introduced into the root canal. In Some cases, dentists attempt to use a Small diameter cotton Swab to wipe the wall of the canal or use paper points. But there is no effective and convenient means to determine the presence of moisture and whether the moisture is a positive or a negative pH.

Red Cabbage (*Brassica oleracea*) is one of many foods containing natural pH indicator compounds. The characteristic coloring of red cabbage is due to anthocyanins expressed in the leaves of the cabbage.

The aim here is to provide a potential instant chairside method for determining the presence of moisture in the root canal system by a simple Visual color change test using red cabbage, a natural pH indicator.

**Methods:** The natural pH indicator is impregnated into the lower portion of the paper point. Acidified/ basified solutions of different pH are prepared. The paper points are dipped in to the acidified/ basified solutions and change in color are determined.

**Results:** Standard solutions of HCl NaOH buffer was made using titration method ranging from a pH of 3 -13. Color change was obtained in the cabbage juice impregnated paper points. Whatsman Paper was taken as a standard control.

**Conclusions:** Impregnating Red Cabbage juice as a natural pH indicating agent on paper points will provide an effective, convenient, reliable and cost-effective method by which professionals can assess the pH of the root canal system.

**Rehabilitation of a Patient with Dento-Alveolar Fracture in the Mandibular Anterior Zone due to Trauma**

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**Introduction:** Traumatic dental injuries occur most frequently in children and young adults. Proper diagnosis, treatment planning and follow up are very important to assure a favorable outcome.

**Case Report:** An 11-year-old female patient administered to our clinic with the history of trauma. Her family reported that the patient fell when she was biking and hit her chin on the sidewalk yesterday evening. At the emergency room an oral surgeon reduced the fracture and immobilized it with a suture. Clinical and radiographic examination, showed that alveolar process fracture including three teeth at mandible(42,41,31) and also uncomplicated enamel-dentin fracture at teeth 11, 21, 41, and 42. After anesthetic injection, the suture was removed, and replaced with a semi-rigid fiber splint. Esthetic restorations of 11 and 21 were completed. A week later root canal treatment using calcium hydroxide was started for 42, 41, and 31. After 4 weeks teeth were asymptomatic and periodontal tissues were healed. Endodontic treatment of 42, 41, and 31 was completed and fiber splint was removed. In 15-months follow-up, the teeth were asymptomatic and the line of fracture was clinically and radiographically normal. The patient said that she was satisfied with the aesthetics and function of the teeth.

**Discussion:** Damage occur in dentoalveolar injuries can vary depending on the severity of the trauma, the elasticity/shaped/direction of arrival of the impacting body, the extent of the lips and other soft tissues, and the position of the teeth and jaws.

**Conclusion:** In traumatic dentoalveolar injuries, the affected teeth can be successfully treated with the right treatment approach and cooperation established with the patient and parents.

Endodontics, Special Needs Patients

## **Multiple Endodontic Treatments in a Patient with Intellectual Disability: A Case Report With 12 Months of Follow-Up**

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**Introduction:** The objective was to report a case of multiple endodontic treatments with hybrid instrumentation and non-pharmacological management of behavior in patients with disabilities.

**Case report:** PBN, male, melanoderma, 17 years old, diagnosed with intellectual disability and asymptomatic epilepsy, attended the FOUFRJ Disabled Patients Clinic for review. Teeth 11, 21 and 22 had an uncomplicated enamel / dentin fracture resulting from trauma. The radiographic examination showed radiolucent images suggestive of a periapical lesion in the 3 teeth. In multiple sessions, the Say-Show-Do technique was used, infiltrative anesthesia, absolute isolation, endodontic and restorative treatment. After initial exploration and determination of dentistry (file type k # 10) with apical locator, manual instrumentation (files k # 55 - # 80) and reciprocating (Wave One Gold Large file) were performed, with irrigation of sodium hypochlorite 2, 5% and EDTA 17%. Gutta-percha cones anchored at the working length cemented with Endofill and then condensed were used for filling. Teeth 11 and 22 were restored with composite resin and 21, rehabilitated with fiberglass pin and direct resin veneer.

**Discussion:** Clinical and radiographic follow-up showed: within 6 months, reduction of radiographically periapical lesions; and, at 12 months, 100% of clinical and radiographic success.

**Conclusion:** It was concluded that periodic consultations in patients with intellectual disabilities, with individualized behavior management, allow the execution of successful endodontic treatments.

Endodontics

### **Most Frequent Microorganisms in Root Canals with Pulp Necrosis of Temporary Teeth: Systematic Review**

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**Background:** Faced with this situation, carrying out systematic reviews of scientific literature makes it possible to include enough evidence to allow its analysis in certain topics. The knowledge of the presence of the most frequent microorganisms in root canals with pulp necrosis of temporary teeth will allow us to establish an adequate protocol of attention with the aim of achieving optimum results on a pediatric patient.

**Literature review:** a literature research was performed through the PRISMA system, about microorganisms in root canals with pulp necrosis of temporary teeth on a database PubMed, Elsevier, Scielo and google Academic, 756 studies matching the terms on the research in title or summary were identified, a revision was carried out later on the titles and summaries, and 724 articles did not comply with the topic to be studied. 32 remaining articles were recovered and finally only 7 articles were identified as relevant to the inclusion in the review

**Conclusions:** the presence of the most frequent microorganisms in root canals with pulp necrosis of temporary was *Bifidobacterium Spp2*, *Streptococcus mutans*, *Enterococcus faecalis*, *A. Naeslundii*, *Fusobacterium nucleatum* and intermediate Pre-bottle.

### **Comparison of Instrumentation Time and Cleaning Efficacy Between Rotary and Manual Instrumentation Techniques in Primary Teeth an Invitro Study**

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**Background:** One of the challenges faced by pediatric dentists is to find an appropriate instrument for biomechanical preparation of primary teeth, which could effectively and efficiently clean the tortuous root canal system in minimal time. Numerous studies were done with rotary instruments designed for permanent teeth with this regard. Kedo-S files were designed specifically for primary teeth. Aim of this study was to compare the instrumentation timing and cleaning efficacy of Kedo-S files with manual K files

**Methods:** Primary teeth were collected and stored in formalin. Study was carried out in 60 root canals of primary teeth. These were divided into two groups of 30 each. Group 1-teeth instrumented with manual K files, group 2-teeth instrumented with Kedo S files. Instrumentation time was recorded using a stopwatch. After biomechanical preparation of two groups, the teeth were cross sectioned and observed under stereomicroscope and cleaning efficacy was qualitatively assessed by a blinded observer.

**Results:** There was a statistically significant difference ( $p = 0.001$ ) in the instrumentation timing between manual K files (3.36 minutes) and Kedo-S pediatric rotary files. The cleaning efficacy of Kedo-S files in the coronal ( $p = 0.014$ ) and middle third ( $p = 0.02$ ) was superior and statistically significant than manual K files. In the apical third manual K files were superior to Kedo S files but were not statistically significant ( $p = 0.121$ ).

**Conclusion:** Considering that a quality treatment can be delivered in short chairside time Kedo S files can be considered as an adjunct to manual files. However further clinical studies are required to use these rotary file systems as an alternative to traditional file systems.

**Revascularization of Immature Permanent Teeth: 2 Case Reports**

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**Introduction:** In young permanent teeth the ideal treatment for thickening of the dentin walls and increasing root development would be to stimulate the regeneration of a functional pulp-dentin complex. The purpose of this case report is to follow up regeneration therapy as today's treatment approach.

**Case Report:** In the first case, a 8.5-year-old male patient was admitted to our clinic with pain and percussion sensitivity 6 months after the restoration of the uncomplicated crown fracture in the upper right central incisor tooth with composite. In the second case; A 10-year-old girl patient presented to our clinic with deep dentin caries and pain in the lower right second premolar tooth. In both cases, regeneration therapy was planned and applied since the teeth had not completed its development and apical opening was present. It was observed that both teeth were asymptomatic and the root development was completed during the 18-month clinical and radiological follow-ups.

**Discussion:** Regeneration therapy has the advantages of being technically simpler than the traditional apexification treatment in pulp which has necrosis due to trauma or caries, and that the new tissue source created in the root canal system is one's own blood cells. The disadvantages are that the discoloration and root canal obliteration of the tooth and the regenerated tissue, which its source has not been determined due to the application of topical antibiotics.

**Conclusion:** According to the results obtained in case reports, revascularization treatment is thought to be an alternative to conventional apexification treatment for immature teeth.



**CTZ Paste for Endodontic Treatment of Necrotic Primary Teeth: A Literature Review**

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**Background:** The irreversible pulp changes in primary teeth represent a challenge to endodontics in pediatric dentistry. The complex anatomy of these teeth, the lack of cooperation from young patients and the need for a trained practitioner, contributes to these challenges. Based on the Lesion Sterilization and Tissue Repair approach (LSTR), a non-instrumental endodontic treatment (NIET) of primary teeth root canals using an antibiotic paste have been proposed. The NIET technique using the CTZ antibiotic paste, which contains a mixture of chloramphenicol, tetracycline, zinc oxide and eugenol, proposed by Cappiello (1964) has potential for use in pediatric patients due to its low complexity and rapid execution. The aim of the study was to perform an electronic search on Pubmed, Web of Sciences, Scopus, Cochrane Library, LILACS and VHL databases regarding the CTZ paste, up to July 2020.

**Literature Review:** A total of 20 articles referring to laboratorial or clinical studies that evaluated the biocompatibility, antimicrobial activity, clinical and radiographic success rates were included. In vitro and in vivo studies showed that CTZ paste presents wide antimicrobial efficacy and biocompatibility. However, clinical studies demonstrated higher frequencies of clinical success compared to the radiographic success.

**Conclusion:** Although more studies are needed to contribute to the body of evidence, the CTZ antibiotic paste used with the NIET technique may be an alternative for the clinical management of pulp necrosis in primary teeth.

## New Trends in Indirect Pulp Treatment for Primary Molars: SDF vs Ca(OH)<sub>2</sub>

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**Background:** Indirect pulp treatment has been a minimally invasive procedure for deep dentinal caries with considerable success. The study aimed at evaluating and comparing clinical and radiographic outcomes of indirect pulp treatment (IPT) with silver diamine fluoride (SDF) and calcium hydroxide in primary teeth. The present study is a prospective, parallel, interventional, in-vivo, randomized controlled trial.

**Methods:** The study was conducted with a sample size of 50 primary molars, of which, 25 teeth were considered, each for SDF and calcium hydroxide IPT. Clinical and radiographic outcomes were evaluated at one, three and six months for both the groups and were later compared. Data obtained were analyzed using Fisher's exact test. Level of significance was set at p0.05.

**Results:** Statistical analysis of clinical and radiographic outcomes of both groups revealed that IPT using SDF showed 96% success rate at 6 month follow up as opposed to 88% success rate of IPT using calcium hydroxide. However, there was no statistically significant difference found between the groups.

**Conclusions:** SDF can be used as an effective alternative of calcium hydroxide for IPT in primary teeth.

**Review of Clinical and Radiographic Outcomes of Revascularization in Necrotic Immature Permanent Teeth**

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**Background:** Pulp necrosis as a consequence of untreated dental caries or traumatic dental injuries is common in immature permanent teeth. Early loss of teeth due to such reasons can have negative esthetic, functional and psychological impact on children. Traditionally, the treatment of choice for necrotic teeth with incompletely formed roots is apexification in which apical closure is induced by using calcium hydroxide or Mineral Trioxide Aggregate. However, in the last two decades, pulp revascularization has gained popularity due to its major advantage of being able to stimulate apical development and root maturation. Pulp revascularization is a biologically-based approach in which a canal is disinfected to create an environment for proliferation of the potential vital pulp stem cells to create new tissue within the pulp canal space. The objective of this review is to evaluate the clinical and radiographic outcomes of revascularization in immature permanent teeth with necrotic pulp.

**Literature review:** Electronic database Google Scholar and PubMed were used to search the literature for relevant studies. Only 12 studies from the last five years that fulfilled both the inclusion and exclusion criterias were included in this review. The included studies all demonstrated the clinical and radiographic success of pulp revascularization. The treated teeth were asymptomatic, periapical radiolucency disappeared along with a progressive increase in dentinal wall thickness and root length, followed by apical root closure.

**Conclusion:** This review showed high clinical and radiographic success rates of revascularization. Thus, revascularization is an effective treatment approach for the necrosed immature permanent teeth.

**Resorbable Barrier a New Perception for Unerring Obturation in the Primary Dentition**

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**Background:** Pulpectomy is the most quotidian treatment in pediatric dentistry. However, it faces the disadvantage of apical extrusion of the obturating material due to various factors, which can be controlled by placing the apical barrier.

**Methods:** Teeth indicated with pulpectomy and recorded roots was included in this study. Two canals one with barrier and one without barrier were analysed radiographically to determine the scoring of the apical extent of the obturating material.

**Results:** Only one canal showed extruded obturation, while no significant difference was found between test and control canals.

**Conclusions:** Placement of apical collagen barrier prevented the extrusion of obturating material however operator's efficiency is equally important in terminating the obturating material at the desired level.

**MTA Cvek Pulpotomy: Case Report and Literature Review**

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**Introduction:** The Cvek pulpotomy is a technique used in complicated crown fractures in permanent teeth. It includes the removal of 1-3 mm of the coronal pulp located around the pulp exposure. The purpose of the report is to present a case of a complicated crown fracture in a young permanent central incisor and its conservative management that safeguards the development of the tooth and improves the quality of life of the patient.

**Case report:** A 12-year-old patient attended the Pediatric Dentistry Postgraduate Department at the “UPCH” indicating sensitivity after dental trauma. The oral exam revealed a significant crown fracture of the upper right central incisor with pulp exposure. A Cvek pulpotomy was performed on incisor 11. The bleeding was easily controlled at the entrance of the radicular pulp with a cotton pellet and a layer of MTA Angelus® was placed. The tooth was immediately reconstructed with a composite resin. Clinical and radiographic controls at 1, 2, 10 and 16 months showed good healing through a non-pathologic process, and no evidence of apical or periodontal infection.

**Discussion:** Complicated crown fractures can easily evolve into pulp necrosis, causing an alteration in the root development. The Cvek pulpotomy with MTA helps the development of a dentinal bridge and allows an apical closure and the thickening of the dentine walls in order to prevent a future root fracture.

**Conclusion:** In this case, a partial pulpotomy with MTA showed clinical and radiographic success after 16 months, proving to be an excellent conservative alternative for the treatment of complicated crown fractures in young permanent teeth.

**Antimicrobial Effect of Temporary Root Canal Filling Materials against E. Faecalis Biofilms**

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**Background:** The preservation of primary teeth after irreversible inflammation or pulp necrosis have been considered a challenge in pediatric dentistry. The microbial persistence in root canals is the most common cause of failure in endodontics. Since chemo-mechanical debridement is ineffective in eliminating microorganisms, the use of medication is required to disinfect and promote healing prior the obturation. In this sense, the purpose of this study was to evaluate the antimicrobial effect of different intracanal temporary root canal filling materials against E. faecalis biofilm.

**Methods:** Bovine dentin specimens were used to E. faecalis (ATCC 29212) biofilm growth for 7 and 14 days in aerobic conditions at 37°C in a brain heart infusion medium, refreshed every 24 h. Subsequently, biofilms were treated for 7 days according to the following groups: Control (without treatment), Calen®, Ultracal XS, Metapex, and Metapaste. Then, the specimens were washed with a buffered solution and stained with LIVE/DEAD and calcofluor dyes to evaluate the vitality of biofilms and the amount of extracellular matrix, using an inverted laser scanning confocal microscopy. Statistical analysis was performed using Kruskal Wallis and Dunn's post-hoc tests (P 0.05).

**Results:** Ultracal XS provided the highest reduction of the vitality of 7- and 14-day biofilms, followed by Metapex, Metapaste and Calen®. The extracellular matrix was not affected by any treatment.

**Conclusion:** All pastes decreased the vitality of E. faecalis biofilms, not affecting their extracellular matrix.

**Regenerative Endodontics- Successful or Unsuccessful? A Scholarly Review**

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**Background:** As the root development ceases, damaged immature permanent teeth become feeble and unable to withstand physiological forces of mastication subsequently leading to fracture of the root with poor prognosis. Various approaches like apexification using calcium hydroxide or use of MTA against which the root filling can be condensed, have been used. However, there has been a paradigm shift in the management approach using regenerative endodontic techniques (RET) with the aim of inducing maturogenesis with further root development and thickening of dentinal walls.

**Literature review:** This was first described by Ostby in 1961 but gained popularity during the last decade. Based on the concept of the tissue engineering approach to regenerate the pulp-dentine complex in the canal space of the damaged teeth, helps restoration of the development of the arrested tooth root with resolution of the apical periodontitis. Most studies show that over 50% of non-vital immature permanent teeth will be lost in the first 10 years following trauma despite the use of RET over the last decade and have resulted in a short-term survival with questionable and inconsistent success rate.

**Conclusion:** As compared to apexification, regenerative endodontic techniques (RET) has the potential of a high success rate of regeneration with periodontal healing and resolution of clinical and radiographic signs and symptoms of infection. But, the outcome of the continuation of root development remains unpredictable. In addition to this the preservation of structures such as Hertwig's epithelial root sheath may have an impact on the success of treatment outcome.

### **Clinical Efficacy of Two Different Rotary File System with Manual Instrumentation in Comparison to Instrumentation and Quality of Obturation**

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**Background:** Meticulous preservation of a primary tooth is of utmost importance rather than its mere replacement. Premature loss of primary teeth is a huge concern in the arena of pediatric dentistry. Natural tooth is considered as the best space maintainer. Pulpectomy is performed to sidestep extractions and to conserve form and function of primary teeth. Up to now the biomechanical preparation in the pulpectomy procedure was performed with K- file, H- file, Ni-Ti hand files and rotary Protaper files. Recent advancement is the use of a pediatric rotary file by the name of KEDO-S, for performing pulpectomies more conveniently and efficiently.

**Methods:** A total of 60 molars in patients within the age group of 4-10 years having at least one primary tooth indicated for pulpectomy, were selected through a lottery method and divided into 3 groups according to the type of biomechanical preparation (manual instrumentation, Kedo-S and Protaper file system), and their efficacy was compared in terms of instrumentation time and quality of obturation.

**Results:** The KEDO-S pediatric rotary file system and Protaper rotary file system has shown reduced instrumentation time, superior obturation quality, greater ease for the dentist and reduced fatigue of the dentist as well as the children in comparison to the manual instrumentation technique.

**Conclusion:** Kedo-S and the Protaper rotary file system will help pediatric dentists in performing the pulpectomy procedure faster with uniform and predictable quality of obturation.



**“Deal Curves and Risks for Good Seal” – Paediatric Rotary File Systems**

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**Background:** Traditionally, in primary teeth the root canal preparation was performed using hand instrumentation. Since most hand preparation techniques are time consuming and can lead to iatrogenic errors, much attention has been directed towards root canal preparation technique with Ni-Ti rotary instruments. Rotary instruments were introduced to paediatric endodontics by Barr et al. Kedo-S, Kedo-SG, Kedo-SG Blue and are exclusive pediatric rotary file systems for root canal preparation in primary teeth. In recent years, NiTi files with up to 12% tapers have been popular.

**Literature review:** G. Jeevanandan et al (2020) conducted a clinical evaluation of instrumentation time and quality of obturation using pediatric hand and rotary file systems for pulpectomy in primary mandibular molars. The result showed a marked reduction in instrumentation time and superior quality of obturation with rotary Kedo-SG Blue file system followed by Kedo-SH, Kedo-S and hand K-files.

S. Manchanda et al (2020) conducted a systematic review and meta-analysis of randomized clinical trials comparing rotary and manual instrumentation techniques in primary teeth and concluded that rotary canal instrumentation had a similar clinical and radiographic success rate, less postoperative pain and instrumentation time compared to manual instrumentation techniques.

**Conclusion:** Use of rotary instrumentation has revolutionized paediatric endodontics and its greatest advantage is that rotary files do not need to be pre-curved, due to its inherent elastic memory resulting in efficient and quicker canal preparation.

Education in Paediatric Dentistry, Endodontics, Periodontal Disease in Children, Restorative Dentistry

### **Oral Rehabilitation in a Pediatric Patient with Malnutrition: A Case Report**

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**Introduction:** Malnutrition refers to an imbalance between the nutrient supply and the body's demand to guarantee tissue growth. This alteration results in generalized tissue hypotrophy due to lack of nutrients, which leads to oral cavity repercussions, such as a decreased buffer capacity of saliva that triggers dental caries.

**Case report:** A four-year-old male patient, whose diagnosis is Early Childhood Caries, presented with abscesses and generalized gingivitis. After obtaining an adequate medical history and signed informed consent from his parents, a comprehensive rehabilitation, including pulpal and restorative treatments, was planned. Results of a 1-year follow-up will be presented.

**Discussion:** The aim of comprehensive oral rehabilitation in pediatric patients is to preserve the integrity of primary dentition in order to: avoid delays in the patient's growth and development, prevent malocclusion, reduce harmful habits, prevent psychological sequelae, and improve cognitive development, phonation and mastication.

**Conclusion:** Oral rehabilitation of pediatric patients with systemic compromise and Early Childhood Caries can restore their quality of life and improve their psychosocial well-being.

## **Radiographic and Clinical Evaluation of Allium Sativum Oil as a Pulpotomy Medicament in Primary Molars: An In Vivo Study**

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**Background:** Formocresol is universally accepted pulpotomy medicament for primary teeth, even though its cytotoxicity and mutagenicity is of concern. Allium sativum oil (Garlic) manifests anti-bacterial, anti-inflammatory, analgesic and antioxidant property which may serve as a suitable alternative to formocresol. The purpose of the study was to evaluate clinical and radiographic success of pulpotomy using Allium sativum oil and formocresol for 1 and 5 minutes in primary molars.

**Methods:** A randomized clinical trial with 40 vital primary molars in children aged 5 to 8 years was conducted. Samples were randomly assigned into two groups i.e. Allium sativum oil group and Formocresol group, with 20 teeth each. Each group had two subgroups with 1 minute and 5 minute application time. Pulpotomy was carried out in the selected teeth according to inclusion criteria under rubber dam isolation. Once haemorrhage was controlled pulpotomy medicament was applied. The pulp chamber was covered with zinc oxide eugenol cement then restored with type IX glass ionomer cement and a stainless steel crown. Patients were recalled after three, six and twelve months for clinical and radiographic evaluation.

**Results:** Overall comparison between the two groups was statistically non-significant ( $p < 0.05$ ). Nevertheless 5-minute application showed better success than 1 minute application especially

**Conclusion:** Allium sativum oil can be considered as a suitable and cost-effective alternative to formocresol for primary teeth pulpotomy.

## **Pulp Therapy in Primary Molars in Early Childhood: Literature Review**

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**Background:** Pulp therapies in young children are a major challenge.. Age, behavior, characteristics of early stage dentition, nature of the damage (caries, TDI, enamel defects, etc.) are factors to consider when deciding on the best therapeutic alternative for this type of injuries. The preservation of pulp vitality in young patients is the primary objective.

**Literature Review:** The literature review was performed according to the preferred reporting items for Systematic Reviews and Meta-analysis Protocols (PRISMAP). The Pubmed, Scopus and LILACS databases were used, including Meta-analysis, Randomized Controlled Trials and Systematic Reviews of the last 5 years. The keywords used for the search were pulp therapy, dental caries and / or dental trauma in primary teeth. In the 3 data bases a total of 80 articles were selected finally for the review.

**Conclusions:** Most studies indicate that a more conservative approach should be promoted, giving possibility to tissue repair, treatments such as indirect and direct pulp capping with a proper cavity sealing are valid alternatives for a tooth with a normal pulp state. For pulpotomy and pulpectomy therapies in vital teeth, the evidence of success is similar for both procedures. Most studies indicate that more evidence and longer follow-up times of treatments are necessary to obtain more accurate conclusions regarding techniques and dental materials.

**Apexification and Revascularisation: Comparative Literature Review of their role in treating Necrotic Immature Permanent Tooth**

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**Background:** Necrotic immature permanent teeth cater reportedly is 30% of dental trauma injuries. The need to conserve the natural tooth and promote its natural biological growth process has always been a priority for a pediatric dental clinician. Appropriate endodontic treatment for a necrotic immature permanent tooth proves to be a challenge due to its thin dentinal root walls and wide apical foramen.

**Literature Review:** Apexification has been an age old highly practiced treatment modality in providing a calcific barrier at these open apices using either calcium hydroxide or mineral trioxide aggregate. Though this procedure is inexpensive and provides a good response, its shortcomings are determined by the lack of increase in root length, wall thickness and the tooth's susceptibility to future fractures. An alternative recently recommended treatment option is the technique of revascularisation. It provides an opportunity for root maturation of immature tooth by stimulating the periapical vital cells and re-establishing the pulp vascularity. The efficacy of pulp revascularisation as a regenerative endodontic procedure option is currently being studied.

**Conclusions:** Since revascularisation technique is said to be a paradigm shift in the treatment protocol of necrotic immature permanent teeth, a review of comparison with its conventional treatment option is necessary for better clinical judgement. This poster reviews the published literature and provides comparison of different aspects determining the clinical advantage between the conventional apexification procedure and the promising technique of pulp revascularisation.

**Regenerative Endodontic Procedures (REPs) and Dentin Growth Factor Release: A Systematic Review**

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**Background:** Regenerative endodontic procedures (REPs) are promising alternatives for pulp tissues affected by endodontic infections, but there is no consensus in literature of an effective protocol to decontaminate the root canal system, to preserve biomechanical properties and to promote growth factors (GF) release present in dentin. The aim of this systematic review was to evaluate the influence of irrigating agents and intracanal medications on GF release.

**Methods:** Systematic search was conducted on four databases: PubMed, Web of Science, Scopus and Cochrane, considering studies published until 05/2020 and keywords (AND/OR): growth factor (s), endodontics regenerative procedures, irrigation, irrigants, intracanal medicaments, dentin, root canal. In vitro/ex vivo experimental studies were included in the search using PICO question (P=healthy human teeth; I=comparison between GF release rates with the use of irrigating agents and/or intracanal medications; C=no treatments; O=influence of substances on the release of GF). Studies that did not include human dentin or that did not compare different irrigants/medications were excluded. GRADE tool was adapted for in vitro studies to assess the methodological quality.

**Results:** Of the 37 studies selected by titles and abstracts, 11 met the inclusion criteria, from which six studies were graded as high quality of evidence and five studies were graded as moderate quality by GRADE tool.

**Conclusions:** The release rate of different GFs is directly related to the type of irrigant or intracanal medication used in REPs.

### Detection of *E Faecalis* in Root Canals of Primary Teeth

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**Background:** *E faecalis*, most commonly recovered from teeth with failed endodontic therapy, was recently also found in primarily infected teeth. Also, recent studies have shown its presence in primary tooth root canals, correlating it to the failure of pulpectomies. To overcome the failure of pulpectomies; the use of intracanal medicaments or alternative disinfection protocols might become essential.

**Literature Review:** Electronic databases such as EBSCO, Cochrane, and Medline, using electronic search engines such as Pubmed were used to evaluate the literature regarding *E. Faecalis* in the root canals of primary teeth. The initial search with PubMed did not reveal any review of literature specifically regarding primary tooth root canals. To undertake the search, the following keywords were used: *Enterococcus faecalis*, deciduous teeth, endodontics, failed endodontic treatment, endodontic infection, pulpectomy, polymerase chain reaction (PCR), culture.

Experimental studies, written in English as well as literature reviews published during the preceding three decades (1990 to 2020) were used. Only the last three decades were limited for the literature review as the methods used initially were predominantly cultural. With the onset of the 21st century, PCR was used more frequently for the detection of *E faecalis*, as it is more sensitive. The search was not limited to search by country or by type of study.

**Conclusions:** There have been various findings with the presence of *E faecalis* detected by both PCR and culture techniques.

## Endodontics

**Efficacy of 1% Sodium Hypochlorite with or without Activation Techniques during Pulpectomy of Primary Teeth: An In vivo Study**

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**Background:** Success in endodontic treatment depends to a great extent on chemomechanical debridement of the root canals. Although instrumentation removes most of the canal content, irrigation plays an indispensable role, particularly in those parts that are inaccessible. Hence this study was conducted to evaluate and compare the efficacy of 1% sodium hypochlorite as an irrigant activated by ultrasonic and laser in reducing bacterial load in necrotic primary teeth.

**Methods:** Study group consisted of 60 necrotic root canals randomly divided into three groups. All canals were irrigated with 1% sodium hypochlorite. Irrigant in Group A was used without activation, irrigant in Group B was activated by ultrasonic method and irrigant in Group C was activated by laser. Microbiological samples were collected before and after irrigation by inserting a sterile paper point from all the canals. All samples were evaluated by McFarland's scale.

**Results:** Paired T test was used to compare sample means between pre and post treatment groups. There was significant reduction in anaerobic microbial load after laser activation (Group C). Intergroup comparison using ANOVA showed no statistically significant results between the three groups.

**Conclusions:** 1% Sodium Hypochlorite is an effective irrigant to reduce bacterial load in necrotic canals during pulpectomy of primary teeth. Ultrasonic or laser activation can be used as an adjunct during the treatment procedure.



# *Epidemiology*

**Sleep-Disordered Breathing in Children and Adolescents Seeking Pediatric Dental Care**

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**Background:** Sleep-Disordered Breathing has many untoward consequences that may interfere with children's health and might be caused by several risk factors. The purpose of this study was to evaluate the prevalence of high-risk sleep-disordered breathing in children and adolescents seeking pediatric dental care.

**Methods:** In this cross-sectional study, the sample included 65 healthy children and adolescents aged 7-16 years. High-risk of sleep-disordered breathing was assessed using the Pediatric Sleep Questionnaire, a previously validated instrument consisting of 22 questions. High-risk was defined as a positive response to 33% or more of the questions answered. Clinical examination involved: Body-Mass Index, orthodontic examination, enamel defects, birth history and tonsils' size.

**Results:** In this sample, children's mean age was  $9.75 \pm 2.60$  years; 36 (55.4%) were boys and 29 (44.6%) were girls. Overall, 12.3% of children in the convenient sample were at high-risk of sleep-disordered breathing and this was significantly associated with tonsils' size ( $P=0.001$ ), Body-Mass Index ( $P=0.03$ ), Class II molar relationship ( $P=0.03$ ) and posterior crossbite/s ( $P=0.02$ ).

**Conclusions:** The results of this study suggested that approximately 12% of the sample studied were potentially at risk of sleep-disordered breathing. Tonsils' size, Body-Mass Index, Class-II molar relationship, and posterior crossbite/s were positively associated with the risk of sleep-disordered breathing. Therefore, the importance of investigating the risk of sleep-disordered breathing should not be disregarded.

**Association of Possible Awake Bruxism, Facial Type, Oral Habits and Clinical Characteristics in Adolescents**

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**Background:** Possible awake bruxism (PAB) is a masticatory muscle activity that the individual does while awake, this is evaluated by individual's report. The aim of this study was to evaluate the association of PAB, facial type, oral habits and clinical characteristics in adolescents.

**Methods:** With the approval of the institutional Ethics Committee (91561018.5.0000.5149), 403 adolescents answered a questionnaire about PAB, its severity and oral habits (biting objects, biting lips, biting nails). For the diagnosis of the facial type, the Sicher Facial Index was calculated. Clinical characteristics (pain in the masseter muscle, pain in the temporal muscle and attrition wear in anterior teeth) were assessed by a researcher. Descriptive statistics and multinomial regression were performed.

**Results:** Among the 403 adolescents, 234(58.1%) were female and 169(41.9%) were male; mean age was 14.36 years. Adolescents who reported mild PAB were more likely to bite objects often (OR=2.99, CI=1.49-6.00), bite lips sometimes (OR=2.41, CI=1.39-4.17), have more pain in the masseter muscle (OR=2.78, CI=1.28-6.06), and be brachyfacial (OR=0.39, CI=0.19-0.81), when compared to those who did not have PAB. Adolescents who reported moderate/severe PAB were more likely to bite objects often (OR=3.51, CI=1.26-9.73), bite lips often (OR=2.90, CI=1.13-7.43) and sometimes (OR=2.36, CI = 1.00-5.55), have more pain in masseter muscle (OR=6.31, CI=2.56-15.54), in temporal muscle (OR=4.47, CI=1.60-12.45) and be brachyfacial (OR=0.33, CI =0.12-0.95), when compared with those who did not report PAB.

**Conclusions:** The facial type, oral habits and clinical characteristics differed between adolescents with PAB and those without PAB.

**Molar Incisor Hypomineralization (MIH) and its Prevalence the Impact of Oral Health Related Quality of Life in Schoolchildren in the City of Macapá, Amapá, Brazil**

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**Background:** To date, few studies have evaluated the impact of molar incisor hypomineralization (MIH) on the oral health related quality of life (OHRQoL) in schoolchildren. The main target of this study was to first assess the MIH prevalence in Brazilian schoolchildren and second, to investigate the impact of MIH on the OHRQoL.

**Methods:** A cross-sectional study was carried out in 1.155 children aged 8 to 10 years old, coming from public schools in Macapá, Brazil. Calibrated dental examiners performed the children's oral examination for MIH using EAPD criteria. The children answered the Child Perceptions Questionnaire (CPQ8-10). Poisson regression was used to determine associations between the variables.

**Results:** The prevalence of MIH in first permanent molars was 30.8%. Most children (93.7%) have presented some impact, with 89.6%, 68.4%, 66.8% and 62.8% have shown impact on the domains of oral symptoms, functional limitation, emotional well-being and social well-being, respectively. Younger schoolchildren have presented a greater impact on the functional limitations domain (PR: 1.15; 95% CI: 1.04-1.27). However, children with MIH presented a greater impact in the oral symptoms domains (PR: 1.06; 95% CI: 1.02-1.10), functional limitations (PR: 1.26; 95% CI: 1.17-1.35), Emotional well-being (PR: 1.24; 95% CI: 1.15-1.34), Social well-being (PR: 1.26; 95% CI: 1.16-1.38), as well as in the general quality of life (PR: 1.05; 95% CI: 1.02-1.08).

**Conclusion:** It was concluded that the MIH prevalence in Brazilian schoolchildren was high. MIH showed a significant impact on OHRQoL according to children's perceptions.

## **Referral Patterns to the Pediatric Emergency Clinic at The University of the West Indies, School of Dentistry, Trinidad and Tobago**

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**Background:** UWI School of Dentistry provides emergency dental care for children via a 'walk-in' clinic. The volume of patients has been increasing and there appears to be a wider range of cases presenting to the clinic. The purpose of this study was to determine sources and reasons for referral of patients to the paediatric dental emergency clinic and to identify factors that can improve the efficiency and quality of services provided.

**Methods:** Referral records for consecutive patients attending the paediatric dental emergency clinic were reviewed for reason and source of referral and the region referred from. Data was collected over a three-month period. Reasons for referral were recorded based on a list of pre-defined criteria and categorised by their sources of referral.

**Results:** Referral records were reviewed for 200 patients. The most common reasons for referral were for toothache or abscess (36%), followed by those with extensive dental disease (15.5%), medically compromised (13.5%) and dental trauma (9.5%). The most frequent sources of referrals were from public health dentists (34%), followed by hospital departments (25%) and self-referrals (24.5%). Children with toothache or abscess were the most common referrals to the clinic, and the majority were from the public dental services. Referrals came from across the county with the majority from the North and Central regions.

**Conclusions:** These findings indicate that referrals to the clinic are mainly for emergency care, but the service is also being utilized for diagnostic services and treatment planning, through referrals from hospital department and general dental practitioners.

**Compromised First Permanent Molars: Generating Utility Values for Different Treatment Strategies**

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**Background:** Economic evaluation assesses the costs and benefits of different treatment options. Valuing treatments requires an understanding of patient preferences. A utility is a cardinal measure of preference attached to a health state. Data on utility values are sparse in dentistry. The aim of this study was to assess the feasibility of generating utilities for compromised first permanent molars (cFPMs) from a sample of the general public, and to generate utility data to support an economic evaluation of treatment options for cFPMs.

**Methods:** This is an observational study conducted within a Paediatric Dentistry department. Participants included fifty parents of patients who attended the outpatient assessment clinic. A novel questionnaire was developed to elicit utility values for different dental health states. The question formats included a ranking, visual analogue scale (VAS) and time trade off (TTO) exercise.

**Results:** Mean utility values for each health state were generated using the VAS and TTO data. A white filling generated the highest utility (0.786 [VAS], 0.763 [TTO]) and was ranked as the most favourable treatment option. Dental extraction and persistence of a gap generated the lowest utility (0.344 [VAS], 0.523 [TTO]). The ranking and VAS responses had better agreement than the ranking and TTO responses.

**Conclusions:** Generating utility values for cFPMs is feasible. The VAS method appeared to generate the most robust values. This is likely related to the level of participant understanding. These utility values can be used in future cost utility analyses to test the cost effectiveness of management strategies for cFPMs.

## The Relationship of Caregivers` Oral Health Literacy and Children`S Oral Health-Related Quality Of Life: A Cross-Sectional Study

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**Background:** Scientific evidence about oral health literacy and oral health-related quality of life remains unclear. The purpose of this study was to verify the relationship between the level of oral health literacy of caregivers and the children`s oral health-related quality of life (OHRQoL).

**Methods:** This study was conducted with preschool children of 2 to 4 years old in Diadema, São Paulo, Brazil. The examination of 630 children aimed at assessing the prevalence of dental caries (dmft index). Parents were interviewed to obtain information on socio-demographic status, oral conditions, and oral health literacy (OHL). The evaluation of the children`s oral health-related quality of life used the Early Childhood Oral Health Impact Scale (ECOHIS). We fitted zero-inflated negative binomial regression (ZINB) models to assess associations between the study outcome and covariates. As outputs, this analysis provides the PR (Prevalence Ratio), RR (Rate Ratio), and respective Confidence Intervals (95% CI).

**Results:** Children`s oral health-related quality of life was not associated with OHL. Dental caries had a negative impact on the children`s quality of life (p0.005). There was a significant difference in OHRQoL between children with and without dental caries and (p0.05). A negative impact on the quality of life was associated with the number of siblings (PR= 0.70, 95%CI=0.52-0.95). A higher age of the mother reduced the impact on the OHRQoL (PR= 0.72, 95%CI=0.52-0.98).

**Conclusion:** The number of siblings, the mothers` age, and dental caries associated with children`s OHRQoL. This study observed no association between parental OHL and children`s OHRQoL.

**Practice Protocols Implemented by Pediatric Dentistry Practices in India during the COVID-19 Pandemic: A Cross-sectional Survey**

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**Background:** India has presently reported more than 4 lakh cases of COVID-19 infection. Due to an imposed nationwide lockdown by the civic administration and the high risk of COVID-19 transmission in dental settings, a large number of pediatric dental practices in India remained closed between March to June 2020. Practices have since then resumed, but there is no data available studying the altered infection control and clinical protocols of these practices in view of COVID-19 and if they are in accordance with the recommendations of international and national dental organizations.

**Methods:** An online questionnaire was mailed to all registered pediatric dentists in India. Participants were questioned regarding the protocols established in their practice for screening of patients, infection control in waiting areas and the dental operatory, use of personal protective equipment (PPE) and the range of clinical procedures being performed.

**Results:** A majority of the pediatric dentists participating in the survey were conducting tele/video consultations on a regular basis in their practices. The infection control measures used in the practice included socially distanced waiting areas, use of masks by patients in waiting rooms, regular sanitization of surfaces and handles. Operatory protocols included disinfection of spittoons and water lines with sodium hypochlorite, use of air filters, strict use of PPE by all staff.

**Conclusion:** Pediatric dental practices in India have implemented a variety of recommendations by international and national dental organizations in their practice protocols in an effort to reduce the risk of transmission of COVID-19 in dental settings.



## Epidemiology

**Evaluation of Oral Health Status of Children that are Aged between 8 and 10 Years and Living in Yakutiye District of Erzurum Province**

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**Background:** The aim of the academic work to be produced within this research paper is to examine oral health of school-children that are in their mixed dentition period, aged 8-10 years, and living in Yakutiye district of Erzurum province, with regards to parameters like tooth decay status, soft tissue damage caused by untreated caries.

**Methods:** School children from two different randomly chosen schools located in residential areas that are mostly populated by middle-low income families have been subject to the research of this study. Constitute the population of this research were 275 girls and 311 boys. Their age was  $8.95 \pm 0.80$  in average. All the examinations have been performed by one single researcher. Clinical indexes such as DMFT/dmft and PUFA/pufa are demonstrated on this study.

**Results:** The results of this study have turned out with average values such as DMFT  $2.43 \pm 1.68$ , dmft  $4.12 \pm 2.72$ , pufa  $0.75 \pm 1.2$ , PUFA  $0.05 \pm 0.24$ , while decay frequency was 96.1, PUFA/pufa prevalence was 40.9, untreated decay PUFA/pufa ratio was 13.26. A significant difference with a positive correlation has been observed between d score and pufa score ( $p < 0.01$ ). The observation that shows that DMFT and DMFS scores increase and dft, dfs and pufa scores decrease is considered as significant. ( $p < 0.05$ )

**Conclusions:** This research reflected high rates of parameters such as index scores, decay prevalence, the frequency of soft tissue damage caused by untreated caries. The efficiency of protective approaches with support of oral hygiene training must be improved with a view to minimize decay formation, stop decay prevalence and achieve present objectives of WHO in this region.

## How Oral Health Literacy and the Behavior of Parents during the Meals Relate to the Experience of Dental Caries in Children: Cross-Sectional Study

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**Background:** The experience of dental caries in children has been associated with family behaviors. This study verified the association between the level of oral health literacy (OHL) of parents or caregivers, their behavior during the children meals, and the prevalence of dental caries in children (PDC).

**Methods:** In this cross-sectional study, 630 children were examined to determine the PDC and their parents were interviewed to obtain information related to socio-demographic conditions (SDC), OHL using the Brazilian version's of the Rapid Estimate of Adult Literacy in Dentistry – 30 (BREALD-30) and the Parent Mealtime Action Scale (PMAS). The analysis fitted zero-inflated negative binomial regression models to assess unadjusted and adjusted associations between the study outcome and covariates as the BREALD and PMAS.

**Results:** In the unadjusted analysis of PDC, SDC and OHL were associated with the outcome ( $p < 0.05$ ) and the caries severity (CS) was only associated with PMAS. In the adjusted model, PDC was more among 3- (PR=1.85, 95%CI=1.19-2.87) and 4-year-old (PR=2.43, 95%CI=1.60-3.71), those with at least one sibling (PR= 1.66, 95%CI=1.18-2.33). However, children whose parents/caregivers gain  $\geq 2$  Brazilian Minimum Wage were less PDC (PR= 0.66, 95%CI=0.48-0.91). The use of rewards (PMAS) associated positively with the CS (RR= 0.90, 95%CI=0.84-0.97) and parents/caregivers with ideal levels of OHL (PR=0.66;  $p=0.045$ ) associated with a lower PDC.

**Conclusions:** There is association between parental OHL and dental caries in preschool children in the unadjusted model. The age of children, the number of siblings, the family income and the use of reward were associated with dental caries.

### Association of Oral Hygiene Practices with the Outcome of Untreated Dental Caries and its Clinical Consequences

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**Background:** There are a diversity of risk factors associated with the occurrence of early childhood caries (ECC), the mainstay for the prevention of ECC is oral biofilm removal. This study aims to evaluate oral hygiene practices related to untreated tooth decay (UDC) and its clinical consequences in children aged 3-5 years and 6-7 years.

**Methods:** Out of 250 subjects, 138 and 112 participants were recruited in the age groups of 3-5 years and 6-7 years, respectively. The UDC and its clinical consequences were measured using 'd' component of dmft/DMFT index and 'p' component of pufa/PUFA (pulp involvement, ulceration, fistula, and abscess) index, respectively. Data were analyzed by multiple logistic regression analysis.

**Results:** The overall prevalence of UDC among children aged 3-5 and 6-7 years was 94.2% and 26.7%, respectively, while 56.5% and 11.6% of pulpally involved teeth were found in the respective groups. The practice of finger brushing was found to be 4.7 times more likely to have UDC (COR = 4.71(1.21, 18.40). Brushing twice/day resulted in a 39% lower probability of having UDC (COR = 0.61(0.04, 10.09). For pulp involvement, finger brushing was 1.45 times more likely to have pulpal involvement than using a toothbrush (COR = 1.45(0.73, 2.88). Children with irregular brushing habits were 3.2 times more likely to have pulp involvement (COR = 3.21(1.74, 5.93) than once/day.

**Conclusion:** Finger brushing, irregular frequency, and lack of parental supervision over child brushing their teeth, were found to be related to UDC incidence and its clinical consequences.

### **Malocclusion, Bullying and Quality of Life in Students from Low Social Development Regions: A Cross-Sectional Study**

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**Background:** Bullying is a global concern. The goal of this study was to analyze the relationship between malocclusion and bullying, and its impact on well-being and quality of life of students from low social development regions.

**Methods:** This cross-sectional study included 243 schoolchildren between 10 and 17 years from regions with low social development indicators, in Rio de Janeiro, Brazil. Malocclusion was analyzed using Dental Aesthetic Index. Bullying and self-perception of the impact of one's oral condition on quality of life and interpersonal relationships were assessed by questions from National Survey of Schoolchildren's Health (PeNSE) and Child Perceptions Questionnaire 11-14 (CPQ11-14). Data were analyzed using Spearman correlation coefficient and Mann-Whitney tests, considering the groups: 10-11, 12-14 and 15-17 years.

**Results:** No correlation was observed between malocclusion and bullying. However, in the 12-14 group, poor correlations were found between malocclusion and the CPQ11-14 (0.226 – p.01), and between malocclusion and being shy/embarrassed due to teeth, lips, jaws or mouth appearance (0.298 – p.01). Positive correlations were observed between bullying and the impact on the quality of life in 10-11 (0.420 – p.01) and 12-14 (0.425 – p.01) groups. In the older group, positive correlation (.724 – p.01) was observed between concern about what others think of their oral health and the impact on their quality of life.

**Conclusions:** There was no evidence of relationship between malocclusion and bullying in this sample of students from low social development regions in Rio de Janeiro. However, malocclusion affected negatively students' interpersonal relationships and perceived quality of life.

## The Financial and Psychological Impact of COVID-19 Pandemic on Pediatric Dentists: A Cross-sectional Survey in São-Paulo, Brazil

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**Background:** The COVID-19 pandemic has become an unprecedented challenge for dental professionals worldwide. Our aim was to evaluate the financial and psychological impact of COVID-19 pandemic on dentists practicing pediatric dentistry from São Paulo, Brazil.

**Methods:** A cross-sectional study was performed with responses to a semi-structured questionnaire sent to all pediatric dentists registered in the Regional Dental Council of São Paulo (CROSP), Brazil, who have email addresses cataloged in their database. Financial and psychological characteristics (Depression Anxiety and Stress Scale (DASS-21) were assessed.

**Results:** A total of 312 accessed the Google forms link provided from June 25, 2020 until July 02, 2020, and accepted to participate in this study. The majority of the respondents were female (n=285; 91%), aged 30 to 50 (n=183; 59%), living in the countryside (n=180; 58%), not diagnosed with SARS-CoV-2 (95%) and did not belong to any COVID-19 risk group (78%). In terms of educational level, 14% were general dentists that practice pediatric dentistry, 30% had a certificate degree in pediatrics dentistry and 45% had more than one academic degree. Most dentists (n = 182, 58%) worked in the private sector and approximately 40% (n = 124) reported a pay reduction of 10-50%. Regarding signs of anxiety (dry mouth, worry, palpitations and fear) and stress (nervousness, agitation, irritation and intolerance), most respondents reported not feeling (67% and 42% respectively) or feeling sometimes (25% and 44% respectively).

**Conclusion:** For Brazilian dentists practicing pediatric dentistry, the financial impact of the COVID-19 pandemic appears higher than psychological repercussions.

### Correlation of OXIS Contacts using Cone Beam Computed Tomography (CBCT) Images and Photographs

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**Background:** The Contact areas in between primary teeth have been classified as OXIS contacts i.e. O or open type, X or point type, I or straight type and S or curved type. Although a few studies have been conducted on OXIS contacts by means of clinical or radiographic examination, none have correlated the two methods in the same population. The objective of this study was to correlate OXIS contact areas when observed with CBCT images and clinical photographs.

**Methods:** A retrospective cross-sectional study was performed with 1235 contact areas of 367 already existing CBCT images of children, aged 3-10 years, obtained from Children's Dental Centre, South Korea. The type of contacts in between primary molars was scored at occlusal thirds, according to OXIS criteria. Following this, the same patient's records were checked for the presence of clinical photographs and scored according to the same criteria. The correlation between the two methods was done by Cohen's Kappa correlation test.

**Results:** The correlation in the scoring of OXIS contacts between the radiographic and the photographic methods was found to be 0.958.

**Conclusions:** The study found almost perfect agreement between CBCT images and clinical photographs for scoring OXIS contact areas, which implies that the latter is sufficient and a three-dimensional evaluation may not be required.

**Morphological Variations and Prevalence of Aberrant Traits of Primary Maxillary Molars**

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**Background:** Morphological variations in tooth structure expressed as non-metric traits which plays an important role in the field of dental anthropology. The purpose of this study was to determine the prevalence of morphometric traits of primary maxillary molars in children and to classify non-metric traits according to different grades of the Arizona State University Dental Anthropological System (ASUDAS).

**Methods:** This cross-sectional study was carried out in 2128 maxillary segmental dental casts of caries-free children aged 2.5 to 4 years from Puducherry. Two calibrated examiners graded the non-metric traits of both first and second primary maxillary molars utilizing the ASUDAS classification. The data were analyzed, and the results are expressed in the form of numbers and percentages.

**Results:** Of the three non-metric traits studied, Cusp of Carabelli (90.6%) in primary maxillary second molars and Metaconule (15.76%) in primary maxillary first molars seemed to have higher prevalence.

**Conclusions:** This study highlights the prevalence of aberrant dental traits in primary maxillary molars in a population. The study described, for the first time, the existence of these traits in primary maxillary first molars. This will add anthropological significance to the condition of primary dentition in various other populations.

**Do Oral Conditions Influence the School Leaving of Adolescents? A Cohort Study**

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**Background:** The burden of dental caries remains significant and poses a problem to public health. Poor oral health has also been linked with physical, psychological and emotional impact, can affect environmental factors, such as the school. To assess the influence of untreated caries and socioeconomic status (SES) on school leaving among adolescents.

**Methods:** A six-year cohort study was conducted with adolescents who had been evaluated initially from a random sample of 1,134 participants (12 years-old) in 2012 from Santa Maria, Brazil. Sex, socioeconomic status (mother's education and household income), and untreated caries were collected at baseline. The outcome variable, collected at follow-up through self-report, was divided into three categories: adolescents who only studied, who studied and employed, and who leave school. A multinomial regression model was performed to assess the influence of oral disease and SES on school leaving, through relative risk ratio (RRR) and 95% confidence interval (95% CI).

**Results:** From the adolescents evaluated at baseline, 768 participants with a mean age of 17.5 years were re-evaluated at follow-up (67.8% retention rate). Male (RRR: 2.31; 95% CI: 1.19–4.48) and adolescents with untreated caries at baseline had an increment in school leaving at follow-up (RRR: 2.26; 95% CI: 1.12–4.56). Mothers with low education (RRR: 2.24; 95% CI: 1.09–4.61) had a higher probability of having children who leave school.

**Conclusion:** Untreated caries and low SES in early adolescence can influence the tendency to leave school.



### Which Pathological Oral Findings are Associated with COVID-19? A Brief Review of the Literature

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**Background:** The Coronavirus Disease 2019 (COVID-19) spreads rapidly and the oral mucosa has been implicated as a potential route for SARS-CoV-2 entry due to the high expression of angiotensin-converting enzyme (ACE2) receptors in the oral epithelial cells. It has been reported that infected patients can present symptoms and clinical signs in the oral cavity that can be seen in the early stages of the disease. Also, oral findings may be associated with cutaneous manifestations, haematological and immunological systemic changes resulting from the disease. This study aimed to review the literature regarding whether oral findings are associated with COVID-19.

**Methods:** Electronic searches were performed on MEDLINE and the Google Scholar databases.

**Results:** Aphthous lesions; blisters; candidoses; dry mouth; enanthema; erythematous macula; stomatitis; thrombocytopenic purpuras; and ulcer similar to herpetic lesions were reported.

**Conclusion:** Systemic manifestations and drugs intake have been related to the evolution of the disease and could lead to adverse clinical oral signs and symptoms with changes suggestive of COVID-19 disease. Further studies are needed to evaluate whether these findings are associated with the SARS-CoV-2, opportunistic diseases, the drug intake, any other health conditions or a combination of factors. Besides, intraoral examination of the mucosa is of paramount importance, especially for patients with suspected COVID-19.

### Gender Preferences of Parents for Dental Treatments

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**Background:** The aim of this study was to determine parents' genders preferences in choosing dentists for dental treatments for themselves and their children and to investigate the reasons behind these preferences.

**Methods:** After the approval of the ethics committee; The parents of 0-12 aged 289 children were administered a survey who applied to the Department of Pediatric Dentistry. In the first part of survey demographic data and the second part, parents' gender preferences for themselves and their children and reasons for this regarding different types of treatments (filling, surgical procedures such as extraction, canal treatment, orthodontic treatment, dental treatment under anesthesia- sedation in anxious children) were collected.

**Results:** Most of the participants did not have any gender preference of the dentist for themselves (83,6%) and their children (75%). The relationship between the parents' gender and physician preferences were evaluated, no relation was observed ( $p > 0,05$ ). When the reasons for parents' choices for different dental procedures examined; It was observed that parents, who have a daughter (21,3-31,4%) prefer a female dentist, since the gender is same as their children. Whereas those who have a son (29,9-40,3%) prefer female dentist due to being more competent ( $p > 0,05$ ).

**Conclusion:** Gender was not a significant variable in parents' preferences regarding dental health care for themselves and their children. Preferences also were not influenced by different treatment procedures.

**Diagnosis Training and Calibration of Dentists for Molar Incisor Hypomineralization (MIH) Epidemiological Studies**

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**Background:** Epidemiological studies are important for understanding the course of diseases in the population. The most reliable way to perform this type of study is to train examiners for the diagnosis. The objective of this study is to report the impact of an alternative methodology used for calibration process on diagnosis accuracy of MIH and Kappa values improvement.

**Methods:** 68 dentists were calibrated as examiners for diagnosis of Molar Incisor Hypomineralization (MIH) using Ghanin's index. The whole process was divided into 2 phases, with one-month interval between them. At phase 1 there were three meetings with the dentists, while at phase 2 only two meetings. During the one-month interval dentists started practicing MIH diagnosis in children who attended Oral Health Centers and an online follow-up group was created to discuss cases and sort out diagnosis doubts. Moreover, a webpage with educational material was prepared as a support to improve the dentist's skills in diagnosing MIH during this one-month period. The examiners' responses between phases 1 and 2 were compared to a gold standard and the Kappa value was obtained.

**Results:** The average kappa value of examiners at the first phase was  $0,68 \pm 0,23$  and for the second phase it was  $0,88 \pm 0,12$  ( $p < 0,05$ ).

**Conclusion:** The methodology used, which included a first phase of calibration followed by a one-month of diagnosis training supported by online material and online follow-up group and a second phase of calibration was effective for improving the Kappa values and diagnosis accuracy of MIH.

**Salivary Metal Profile of Vulnerable Children in Brasilia, Brazil**

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**Background:** Contamination of the environment by heavy metals is an important public health issue, which can permanently compromise the health and quality of life of those who come into contact with these substances. In this context, children are often more affected, since they are developing and, consequently, are more subject to the effects of these contaminants. Despite this, there are few studies in the literature, which address the salivary characteristics resulting from environmental contamination. Therefore, the objective of this research was to determine the predictive factors of the health problems of children living in a contaminated area, by quantifying, in saliva, the following chemical elements: Pb, Cd, Na, K, Mg, Ca and correlating the results obtained with caries index (DMFT).

**Methods:** Forty children between 6 and 12-years-old, living in Brasília, whose parents were recyclable material collectors, were selected. The chemical elements were analyzed by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). Student's t-test or Mann-Whitney and multiple linear regression models were used. Results were expressed as a partial correlation coefficient.

**Results:** The average value of the concentration of Na and Mg was 254.32 +/- 122.23, respectively; with 95% CI (215.23 to 293.41) and 2.77 +/- 1.01; with 95% CI (2.45 to 3.10). Girls showed higher concentrations of Pb than boys ( $p = 0.0223$ ). In children with salivary Pb content greater than 0.30  $\mu\text{g} / \text{L}$ , the prevalence of health problems was 4.57 times higher than in children, whose Pb content was less than 0.30  $\mu\text{g} / \text{L}$ . There was a significant correlation between Cd concentration and DMFT ( $r = 0.412$ ;  $p = 0.0091$ ).

**Conclusions:** The inorganic salivary profile was changed for Na and Mg, for which the values were lower than those indicated in the literature. Girls were probably more exposed to Pb than boys. Salivary Cd was directly related to DMFT. Further studies are needed to better clarify the influence of the chemical elements analyzed.

### Social Capital and Self-perceived Oral Health of Brazilian Schoolchildren

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**Background:** Social capital refers to the resources resulting from social relationships and has been associated with better health conditions. The aim of this study was to evaluate the association between social capital and self-perceived oral health of schoolchildren.

**Methods:** The data came from a cross-sectional study conducted in 2019 with 354 12-year-old students from 15 schools in southern Brazil. A structured questionnaire was sent home to be answered by guardians and verify the socioeconomic profile of the families; the children answered a questionnaire about their characteristics, last visit to the dentist and social relationships. Social capital was measured through self-reported meetings with friends and the use of messaging applications; self-perceived oral health was measured using the global question from the Child Perceptions Questionnaire. The data were adjusted into a multilevel logistic regression model, with students nested in schools, and input of variables according to a conceptual theoretical model divided in three blocks.

**Results:** After adjustment, it was observed that students from families with lower income (OR = 2.48, p = 0.002), who did not participate in message groups with friends (OR = 2.35, p = 0.015 ) and who had not visited the dentist in the six months prior to data collection (OR = 2.07, p = 0.027) were more likely to classify their oral health as fair or poor.

**Conclusions:** Social capital, assessed by virtual social relationships, was associated with the way adolescents perceived their oral health.

**Relationship of Obesity with Dental Trauma in Preschool Children: A Case-control Study**

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**Background:** Traumatic Dental Injuries (TDI) are very prevalent in primary dentition and can have a negative impact on the quality of life of preschool children and their families. Obese children are more prone to fall, which increases the chances of physical injury. Thus, the objective of this case-control study was to determine the association between obesity/overweight and TDI in preschool children.

**Methods:** The case group was selected from those children with TDI identified by clinical examination (n = 262). Each preschool identified as a case was paired through a drawing with a colleague of the same age, sex and preschool, but who did not have TDI, the control group (262). TDI were assessed using the Andreasen criteria and the presence of an increased overjet was considered when  $\geq 3$ mm. The children's weight and height were measured to calculate the Body Mass Index. Sociodemographic and sucking habits variables were collected through questionnaires. Data analysis involved frequency distribution, chi-square test and univariate and multivariate logistic regression.

**Results:** The final sample consisted of 253 children in each group. Among the children in the case group, 32% (n= 81) were obese and in the control group 22.5% (n= 57). Obese children were more likely to have TDI than children with normal weight (OR=1.54; 95%CI:1.02-2.34; p=0.03). The anterior open bite was considered a risk factor for TDI (OR=3.47; 95%CI:1.58-7.63; p=0.002), as well the increased overjet (OR=2.26; 95%CI:1.42-3.60; p=0.001).

**Conclusion:** Obese children were more probability to have TDI in primary teeth than children of normal weight.

## Global Interest in Mouthwashes as a Preventive Measure in the Covid-19 Pandemic Scenario: An Infodemiology Analysis

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**Background:** Coronavirus disease 2019 (COVID-19), caused by Severe Acute Respiratory Syndrome (SARS)-coronavirus (CoV)-2 virus, was declared a pandemic by the World Health Organization (WHO) on 11th March 2020. As the world is struggling to contain the disease, millions of people are anxiously seeking health related information online. A Google Trends search has become a valuable source of information particularly on the emerging public health topics. The objective of the present study was to analyse the global interest in mouthwashes as a preventive measure in the Covid-19 pandemic through google trend infodemiology.

**Methods:** The following MeSH terms were retrieved: 'mouthwash', 'oral rinse', and 'gargle', between December 30, 2019 to June 30, 2020 with the intention of studying whether there was worldwide increased interest in receiving online information regarding mouthwash during the pandemic. We collected the worldwide SVIs from December 30, 2019 to June 30, 2020 of routine mouthwashes recommended. The various SVIs collected were for the search terms mouthwash, betadine, povidone iodine and chlorhexidine.

**Results:** The trends show a relative increase in the number of searches worldwide since the 2019 coronavirus global pandemic was declared, and this would be an indication that there has been an increased interest in the number of people searching for information about mouthwashes online.

**Conclusion:** Google Trends infodemiology is a valuable source of information on collective health trends and this could be utilised for monitor the global interest during outbreaks such as the current COVID-19 pandemic.

**Early Childhood Caries of 4-5 Years Old Children in Erzurum, Turkey**Fatih Sengul<sup>1</sup>, Gelengül Urvasızoğlu<sup>2</sup>, Tarek Seddik<sup>1</sup>, Sera Derelioglu<sup>1</sup><sup>1</sup>*Department of Pedodontics, Faculty of Dentistry, Ataturk University, Erzurum, Turkey*<sup>2</sup>*Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Ataturk University, Erzurum, Turkey*

**Background:** Early Childhood Caries (ECC) is dental caries in children under 72 months old, associated with multiple predisposing factors and having a negative impact on the quality of life. In this study, our aim was to assess the oral health conditions and ECC prevalence of children in the city of Erzurum, Turkey.

**Methods:** Our cross-sectional epidemiological study was conducted in Ataturk University, Faculty of Dentistry, Pediatric Dentistry Department/Erzurum-Turkey, between 2015-2016. A total of 1156 preschool children, 588 girls and 568 boys with an age median of  $4.9 \pm 0.27$  were included in the study. Restorative care index (RI), dmft, Significant Caries Index (SiC), SiC10, Treatment needs, Care Index and prevalence distribution of carious primary teeth were evaluated. All statistical assessments in the study were performed using SPSS 25 (SPSS Inc., Chicago IL USA) with a 5 % level of significance.

**Results:** 73.27% prevalence of ECC was observed in preschool children with a mean dmft score of  $3.89 \pm 4.08$  and an increase in ECC with the age. We found restorative index as 2.23, SiC as 8.99, SiC10 as 12.36, Treatment needs as 93.55, Care Index as 2.13, and number of lost primary teeth per 100 children as 0.9.

**Conclusion:** High level of ECC revealed the necessity of starting an oral health educational program for mothers and dental screenings for children and the demand for improving the oral and dental services.



**The Paradigm Shift of Indian Dentists Towards Non-Aerosol Procedures for Post-Covid-19 Scenario**

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**Background:** Dentists are at the highest risk to be infected with severe acute respiratory syndrome coronavirus2 when exposed to aerosol-generating procedures. The purpose of the study was to comprehend the outlook of Indian dentists towards non- aerosol procedures for the post-COVID-19 scenario.

**Methods:** The study was conducted among 410 randomly selected dentists in India. The questionnaires were distributed to them through online sources. The data was collected and analysed using SPSS version 21.

**Results:** Half of the dentists prefer examination without an air-water syringe. Nearly all of them prefer to implement pre-procedural mouth rinse and high-volume evacuation devices. Preference in the usage of hand scalers with suction were preferred to ultrasonic cleaning. Usage of sealants in non cavitated lesion was selected over the mechanical method. Awareness in waterlase dentistry was limited. Partial preference in the usage of dental lasers and slow speed instruments and preferred space maintenance in case of an avulsed primary tooth as compared to reimplantation. Most dentists were aware of caries removal agents and atraumatic restorative treatment, but only a few preferred its usage. Some preference was noted to the extraction of the primary tooth with extensive pulpal involvement followed by space maintenance compared to endodontic procedures.

**Conclusion:** The inclination of dentists towards non-aerosol procedures is not satisfactory and there should be more awareness regarding risks involving in aerosol-generating procedures.

**Prevalence of First Permanent Molars Amongst 6 Years-Olds in Turkish Republic of Northern Cyprus**

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**Background:** To calculate the prevalence of the presence of first permanent molar teeth amongst 6 year-olds in Turkish Republic of Northern Cyprus.

**Methods:** A total of 425 children aged 6 were included in the study (Female:210, Male: 215). According to World Health Organisation (WHO) 2013, oral health surveys basic methods guide, the presence of a tooth was recorded if any part of it occurs in oral cavity. Differences between eruption prevalence of all four sites (right, left, maxillary and mandibular) separately, bilaterally (right-left), and maxillary molars to mandibular molars were recorded at the age of 6 for males and females. Furthermore, by using WHO criteria oral health status was assessed by using DMFT (decayed, missing, filled permanent teeth)-index. Data were statistically analysed using Chi-square test.

**Results:** Although there were no statistically significant difference between right and left permanent first molars, the prevalence of erupted mandibular permanent first molars (80.2%) were statistically significantly higher compared to maxillary permanent first molars (76%) (p0.05). Eruption of both left and right first permanent mandibular molars were statistically significant in female compared to male (p0.05). The percentages of carious first permanent molars were 18% for right mandibular, 17.4% for left mandibular, 13.3% for right maxillary, 16.1% for left maxillary.

**Conclusion:** It can be concluded that there is a variation for timing of eruption of first permanent molars in Turkish Cypriots at 6 year-olds.

**Association between Possible Awake Bruxism, Smartphone use and Sleep in Adolescents**

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**Background:** Awake bruxism is a jaw-muscle activity that occurs during wakefulness and has a multifactorial etiology, involving emotional and sleep factors. This study aimed to explore the association between possible awake bruxism (PAB), smartphone use and sleep among adolescents.

**Methods:** A cross-sectional study with 403 12-19 years adolescents was conducted in Belo Horizonte, southeast Brazil. Information about severity of PAB, sleep characteristics and smartphone use were collected through a self-reported questionnaire. Descriptive analysis and Multinomial Logistic Regression were performed (p 0.05).

**Results:** Adolescents had a mean age of 14.3 ( $\pm 1.5$ ) years. Most were girls (58.1%) and enrolled in public schools (52.9%). The prevalence of PAB was 51.6%, being 37.2% mild PAB and 14.4% moderate/severe. Adjusted model showed that age (OR=0.801; 95% CI= 0.684-0.938), hours of sleep (OR=0.826; 95% CI=0.686-0.994), report of frequent pain in the neck due to smartphone use (OR=2.958; 95% CI=1.342-6.523) and spending more time on smartphone during weekends and holidays (OR=1.749; 95% CI =1.029-2.971) were associated with mild PAB. Moderate/severe PAB was associated with reasonable/bad sleep quality (OR=2.592; 95% CI=1.308-5.138), adolescents from private school (OR=2.169; 95% CI=1.066-4.413), spending more time with smartphone during weekdays (OR=2.258; 95% CI=1.019-5.006) and report of frequent (OR=11.267; 95% CI=3.960-32.060) and seldom (OR=2.390 ; 95% CI=1.025-5.570) pain in the neck due to smartphone use.

**Conclusions:** Adolescents' age, school type, hours of sleep, sleep quality, habits of smartphone use and report of pain in the neck due to smartphone use were factors associated to possible awake bruxism.

## A Review of Covid - 19: Safety and Disinfection Protocols in Dental Scenario

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**Background:** Covid- 19 has been declared global public health emergency. This existing pandemic situation has created enormous pressure and anxiety among dental professionals. The awareness and knowledge about the safety and disinfection protocols can bring positive change in the attitude

**Literature review:** Kamate et al. (2020) conducted a study to assess the knowledge, attitudes and practices of dental practitioners regarding the COVID-2019 pandemic and the dentists were found to have good knowledge and practice scores, which is important to combat COVID-19. Muhammad et al. (2020) assessed fear and practice modification among dentists to combat novel coronavirus disease outbreak and stated that despite having a high standard of knowledge and practice, dental practitioners around the globe are in the state of anxiety and fear while working in their respective field. Quadri et al. (2020) did the study to investigate the current knowledge on COVID-19 among the dental health care workers and found that many were unaware of the disseminated COVID-19 information. Sarfarz et al (2020) indicated a lack of knowledge (88.8%)in fundamental aspects of disinfection protocols with a significant and positive attitude(89.9%) from dental professionals towards disinfection regarding Covid-19.

**Conclusion:** This review gives the knowledge about safety and disinfection protocols during covid 19 that can help to create the positive attitude in the dental scenario.

## Evaluation of the Perceptual and Emotional Status Changes of Turkish Dental Students Caused by COVID-19 Pandemic upon Pediatric Dentistry Clinic

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**Background:** Coronavirus infection caused by a pathogen called Covid-19 has become a major public health issue all around the globe, starting from China. Due to the nature of dentistry applications, dental health professionals are very likely to receive the infection. The aim of this research is to evaluate the awareness of future dentists on Covid-19 pandemic's effect especially upon pediatric dentistry clinic, emotional status and point of view changes about the future of the profession.

**Methods:** A cross sectional study design was used for the study. Our sample consisted of dentistry students from all over Turkey; among them 4th and 5th grade students who had undergone pediatric dentistry training were included. A questionnaire was created on Google Forms and transmitted to students via several on-line platforms. All answers kept anonymous.

**Results:** A total of 1101 students (65,6% female and 34,4% male) answered the questionnaire. All participants were between 19-24 years old. More than a half of the participants (55,7%) strongly agreed that clinicians are under higher risk of getting infected in a pediatric dentistry clinic, children are more likely to be asymptomatic even they are infected. 69% strongly agreed more protection is required during dental applications; whereas 53,7% strongly agreed that elective dental care should be postponed during the pandemic. 26,8% are seriously concerned about the future of the profession.

**Conclusion:** It could be concluded that pandemic widely effected future dentists' perception and decision making in pediatric dentistry clinic. Pandemic arose their worries about the future of dentistry.

## The Effect of Socioeconomic Class on the Oral Healthcare Practices of Secondary School Students in Lagos, Nigeria

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**Background:** Secondary-school students are at a crucial stage in their life where decisions on oral health transit from the role of parents/guardians to their sole responsibility. Understanding factors that influence their oral healthcare practices is of paramount importance. Socioeconomic class (SEC) has been suggested to have a varied effect on oral health. Therefore, the aim of this study was to determine the effect of SEC on the oral healthcare practices of secondary school students

**Method:** A total of 385 secondary-school students in Surulere, Lagos, Nigeria were selected by multistage sampling method. Information collected via a self-administered questionnaire included socio-demographic characteristics, SEC using the family affluence scale by Currie 1997, oral hygiene practices, dietary habits, oral healthcare utilization and oral health perception. Data collected were analyzed using Epi Info statistical analysis software.

**Results:** A total of 370 students with a mean age of 14.95±1.44 participated in the study. 32% of the study population was of low SEC, 55% of middle class and 13% of high class. There were significant associations between high SEC and brushing twice daily (p0.05), using dental floss (p0.05), consuming carbonated drinks (p0.05) and oral healthcare utilization (p0.05). The mean OHI score was 1.12 and the higher the SEC, the better the OHI (p0.05). The prevalence of dental caries was 15% with mean DMFT of 0.25. Caries experience increased with SEC (p0.005).

**Conclusion:** Higher SEC led to better oral hygiene and oral hygiene practices but also led to poorer dietary habits and caries experience.

**Compound Odontoma of the Anterior Maxilla Associated with Displaced Lateral Incisor: A Case Report**

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**Introduction:** Odontomas are the most common odontogenic tumors worldwide considered to be developmental anomalies (hamartomas) rather than true neoplasms. They can be differentiated into compound type or complex type with only the compound type resembling tooth structure. Compound odontomas are more commonly found in the anterior maxilla while complex odontomas are more commonly found in the posterior mandible. Odontomas are usually chance findings seen on routine dental examinations. However, on progression they may be associated with bone expansion, late eruption of permanent teeth, and adjacent tooth displacement.

**Case report:** We report a case of an 11-year-old girl who presented at the Lagos University Teaching Hospital (LUTH) pediatric dental clinic with a complaint of painless enlargement of the left anterior maxilla of 2-years duration. The swelling was located between teeth 21 and 22 and was associated with distal displacement and mesial angulation of tooth 22. Clinical, radiographic and histopathologic investigations revealed a compound odontoma. Surgical exposure and enucleation was done to remove the tumor. The patient's postoperative course and 6 months follow-up were uneventful. The patient was then planned for management of the malocclusion.

**Discussion:** Odontomas are clinically significant because they cause impaction and malalignment of both primary and permanent teeth making their prompt and asymptomatic removal of paramount importance for proper teeth eruption and alignment.

**Conclusion:** This report elucidates the importance of routine dental check-ups and minimally traumatic management of odontomas in pediatric dental patients to prevent adverse effects of odontomas thereby, minimizing the interventions needed after enucleation.

### Reducing Primary Teeth Caries in Serbian Preschoolers

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**Background:** Although preventable, primary teeth caries is widely prevalent involving 532 million of cases worldwide. This survey attended to explore factors affecting poor oral health in Serbian preschoolers so adequate preventive interventions could be designed.

**Methods:** A cross-sectional epidemiological survey involved stratified cluster sampling in order to obtain a nationally representative sample of children attending public kindergartens in Serbia (aged 12 to 91 months). was conducted involving children aged 12 to 91 months of age attending public kindergartens in Serbia. Sample involved 3 age groups: toddler group (12 to 36 months of age), kindergarten group (36-71 months of age), and preschool group (72-91 months of age).

**Results:** Total of 3676 preschool children participated in the study. More than half of children in public kindergartens suffer from caries (57.6%). Most children (60.1%) brush their teeth once a day or rarely. The highest frequency of poor tooth brushing was observed in children aged 36-71 months, involving 76.3% of participants who brush their teeth once a day or rarely. More than two thirds of children (70.1%) consume sweets every day, with highest frequency in 36-71 months age group where 80% of children regularly consume sweetened food each day.

**Conclusions:** Present national survey suggested that additional preventive interventions regarding healthy lifestyle habits are needed in children attending kindergarten that could tackle both oral and future general health.

The data were collected within Program for Oral Health Improvement in Children and Youth in Serbia (number 1802, activity number 4015), Government of Serbia, Ministry of Health



### Oral Hygiene Status of Primary School Children in a Nigerian Rural Community

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**Background:** The purpose of using tooth cleaning aids like chewing stick, toothbrush with fluoride containing toothpaste, is to attain good oral hygiene compatible with good oral health. The purpose of this study was to determine the oral hygiene status of government primary school children in a rural community in South-east Nigeria.

**Methods:** A cross sectional descriptive study of 8-14 year-old primary school children was done in a government primary school in Nkanu -West local Government Area of Enugu State. Ethical clearance for this study was sought and obtained, socio-demographic data was obtained using interviewer-administered questionnaire. Oral hygiene status was determined using simplified oral hygiene index (OHI-S). Data were analysed using SPSS Version 20. P values 0.05 were accepted as being statistically significant.

**Results:** 57(46.3%) males, 66(53.7%) females were seen and examined, giving a male to female ratio of about 1:1.2. Mean simplified oral hygiene index (OHI-S) score was  $1.5 \pm 0.4$ , 80 (65.0%) had fair oral hygiene, 41(33.3%) had good oral hygiene while 2(1.6%) had poor oral hygiene status. Good oral hygiene status was seen more in females than males, while fair oral hygiene status was seen more in males than females. Majority of the school children brush their teeth once daily, using the horizontal scrub technique and the duration of tooth brushing was about two minutes.  $P= 0.14$

**Conclusion:** In this study, 65% of the school children had fair oral hygiene status. The correlation between oral hygiene status with age or gender was not statistically significant.

**Determinant Factors of Dental Caries Incidence in Schoolchildren: A 7-year Longitudinal Study**

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**Background:** Dental caries (DC) is a major public health problem that substantially affects individuals, families, and the community's lives. Longitudinal studies in oral health become essential in order to verify which exposure factors would be related to an oral health outcome. The aim of this study was to investigate determinant factors related to the incidence of DC in Brazilian schoolchildren, after a period of seven years.

**Methods:** At baseline (T0), 851 students from 7 to 12 years old were included. All participants who after 7 years had not received any orthodontic treatment were invited to participate in follow-up (T1) (n = 411). Descriptive analysis, chi-square tests, Mann-Whitney, and Poisson hierarchical regression were performed.

**Results:** A total of 330 students participated in the two moments of the study. The DC incidence was 64.8%. The final model of Poisson Regression revealed that students whose mothers had eight years of schooling or less had a 19% greater risk of developing DC (95% CI 1.03-1.38; p = 0.020). In addition, those who had previous caries experience (95% CI 1.24-1.80; p 0.001) and a poor self-perception of oral health during the baseline (95% CI 1.01-1.37; p 0.032), had 49% and 18% greater risks of developing new caries lesions after seven years, respectively.

**Conclusions:** Previous experience of DC, low maternal education, and poor self-perception of oral health were considered risk factors for the development of new caries lesions among students after a period of seven years.

### **Teledentistry In Pediatric Dentistry: Bridging The Urban Rural Gap in India**

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**Background:** Oral health of children in rural India remains compromised due to lack of access to Pediatric dentists. In such areas, teledentistry would be useful but a major hurdle is the availability of trained persons who could carry out real time consultation using the intraoral camera and video conferencing with the Pediatric Dentist.

**Methods:** This was an observational study having a convenience sample of 150 children in the age group of 6-10 years, living in villages. Thirty Primary Health Center / Anganwadi (rural day care centres) employees were also chosen and trained for performing the examination with the intraoral camera. Four self administered, non-structured questionnaires were prepared having five simple questions to understand the knowledge, awareness and attitude of the participants toward pediatric dentistry and their acceptance of teledentistry. Live videoconferencing was carried out between the children/parent and the dentist. A provisional assessment was done and evaluation was carried out as to whether a referral to the hospital was required.

**Results:** Most children (83.3%) were not scared when examined using intraoral camera and felt that the use of intraoral camera was better than going for dental visit. Most of the PHC/AW workers (84%) found the concept of teledentistry very convenient, easy to learn and adapt and (92%) thought that teledentistry is time saving.

**Conclusions:** Teledentistry is a possible way for providing oral health consultation in rural areas. With today`s reliable digital and online technologies, it will help in bridging the gap and promote distant oral health education.

**Study of the Impact of the COVID-19 Pandemic on Pediatric Dentistry Practice: Preliminary Results**

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**Background:** During the COVID-19 pandemic, general medical treatment has received most attention, whereas only few studies address the potential effects on Pediatric Dentistry and Orthodontic treatment.

**Methods:** As part of an ongoing larger study, we developed a questionnaire that aims to investigate the impact of the COVID-19 pandemic on the medical activity in dental offices providing pediatric dentistry and orthodontics services.

**Results:** Out of the 73 pediatric dentists and orthodontists from Romania who participated in the survey, over 50% have noticed an increased reluctance of patients to come for dental treatment since the beginning of the pandemic. A range of additional protection measures were widely introduced in the waiting rooms, including the playground areas, as well as in the operatories, for both patients and medical staff. Over 90% of the respondents claimed they now restrict the access of caregivers to the treatment room more than before. Nearly 80% assume that during dental procedures in the pediatric patient, the risk of SARS-CoV-2 transmission is comparable to that in adult patients. Regarding behavior management in the context of COVID-19 pandemic, 60% consider that the dental treatments, including the interceptive orthodontic treatment, have been negatively impacted, compared to the pre-pandemic period, with new challenges having emerged.

**Conclusion:** Research evaluating the direct consequences of the COVID-19 pandemic on the practice of Pediatric Dentistry is highly needed, in order to assess its multilateral effects, and to constantly adapt to the new realities, ensuring safety and quality of the dental treatment.

## Epidemiology

**Method of Addressing the Problem of Epidemiological Assessment of the Number of Extracted Temporary Carious Molars at the Mixed Dentition Stage**

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**Background:** Registering missing temporary teeth in children is challenging due to a lack of information about the cause for their loss; hence the methods that imply incomplete accounting or ignoring information about the extracted carious teeth are used. The study aimed to examine the possibilities to assess early loss of temporary molars (m1, m2) using actual information regarding premolars eruption (P1, P2).

**Methods:** The method by C. L. Kumar (1990) enabled the parameters of the actual statistical ages of temporary molars loss and the ages of premolars eruption to be calculated in 1331 children aged 6-13 years. The frequencies of occurrence of unsubstituted lost temporary molars (ULTM) were computed in children grouped by age, sex and residence. The Student's and Pearson's tests were applied for statistical analysis.

**Results:** Lag period between timing of the statistical onset of temporary molars loss and premolars eruption was 1.5 (m1/P1) and 2.0 (m2/P2) years. The percentage of ULTM was 5.5% for m1 and 2.5% for m2 in 6yo children, and peaked by 9yo (9.8% and 6.8% respectively). In all children, the percentage of ULTM m1 was higher than ULTM m2 ( $p = 0.014$ ). No difference was detected between the sexes. The percentage of ULTM was higher in rural than in urban residents ( $p = 0.002$ ).

**Conclusion:** The use of analysis of statistical parameters of teeth loss and eruption timing at the mixed dentition stage seems promising for a comparative quantitative assessment of the early loss of temporary molars due to caries.

**Determinant Factors of increased Severity of Malocclusion in Schoolchildren: a 7-year Cohort Study**

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**Background:** Identification of the risk for severity of malocclusion in the permanent dentition based on information from mixed or primary dentition may assist in defining the most appropriate intervention stage and providing adequate orthodontic therapy. The aim of this study was to identify risk factors associated with the increased severity of malocclusion between mixed and permanent dentition.

**Methods:** At baseline (T0), 851 students from 7 to 12 years of age, in the mixed dentition, were included. All participants who after 7 years had not received any orthodontic treatment were invited to participate in follow-up (T1) (n = 411). To assess malocclusion, the Dental Aesthetic Index (DAI) was used at T0 and T1, comparing its absolute value and each of the 10 items that compose it. Untreated dental caries and early loss of primary teeth were also evaluated. The ordinal unadjusted and adjusted logistic regression was adopted (p-value 0.05).

**Results:** Malocclusion (DAI 25) was present in 49% of participants (62.2% exposed and 32.8% unexposed). The variables associated with malocclusion in permanent dentition were: anterior irregularity in mandible  $\geq 2$ mm (OR: 2.02, 95% CI 1.15-3.57; p = 0.015), maxillary overjet  $\geq 4$ mm (OR: 2.99, 95% CI 1.48-6.06; p 0.001) and anterior open bite (RR: 6.33, 95% CI 1.74-22.95; p=0.005).

**Conclusion:** The anterior mandibular irregularity of 2mm or more, increased maxillary overjet, and anterior open bite were considered as risk factors of the increased severity of malocclusion after the transition from mixed to permanent dentition.

## Factors Related to the Psychosocial Impact of Dental Aesthetics in School Adolescents: A Cross-Sectional Approach

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**Background:** Oral problems can negatively affect adolescents' lives in the short and long term, mostly in this age stage since they tend to be strongly concerned with body image, which in turn plays an important role in a psychological and social context. The aim of this study was to investigate factors related to the psychosocial impact (PI) of dental aesthetics on school adolescents.

**Methods:** This cross-sectional study was carried out in Diamantina, Brazil. The sample was composed of school adolescents aged 13 to 19 years. The PI of dental esthetics was assessed using the Brazilian version of PIDAQ. The oral examination was performed in the school setting. To Data analysis, descriptive analysis and Poisson regression were performed.

**Results:** The final sample consisted of 323 adolescents, being the majority composed of girls (54.4%). Multivariate regression analysis revealed that adolescents whose families have a monthly income of less than two minimum wages (95% CI 1.06-1.39) had PIDAQ scores 22% higher than adolescents from families with a high income. Those students with anterior dental crowding (RM [mean ratio] 1.25; 95% CI 1.05-1.48), consequences of untreated caries (RM 1.42; 95% CI 1.19-1.69) and anterior maxillary misalignment ( $\leq 2$ mm: RM 1.19; 95% CI 1.01-1.42;  $> 2$ mm: RM 1.55; 95% CI 1.27-1.88) also presented higher PIDAQ scores.

**Conclusion:** School adolescents of a lower family income and those who presented anterior dental crowding, anterior maxillary misalignment, and with consequences of untreated caries had a higher negative impact on dental aesthetics in their psychosocial context.

**Signs and Symptoms during Primary Tooth Eruption in Babies Born at the University Hospital of Brasília**

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**Background:** Signs and symptoms associated with primary tooth eruption have been studied but the direct relationship between them is still controversial. The aim of this study was to evaluate the signs and symptoms during the eruption of primary teeth and the methods used to relief the pain.

**Methods:** For this, 260 babies up to 20 months old belonging to a birth cohort study at the University Hospital of Brasília recruited from August 2017 to July 2018 were evaluated. During the follow-up appointment, a questionnaire was given to the mothers containing questions regarding the signs and symptoms related to the tooth eruption, as well as whether a pain relief method was used. The data were analyzed, descriptive statistics and Chi-square test was performed.

**Results:** The sample consisted of 52.7% girls and 47.3% boys. The mean age was 13.07(±1.03). Most of babies (94.8%) had some symptom and 65.1% had some eruption sign during the tooth eruption. The main symptoms were: irritability (85.2%), sucking fingers (79.7%), crying (68.6%), drooling (65.3%), fever (58.5) and diarrhea (57,2%). Regarding the oral signs, swelling was the most prevalent (53%), followed by gum redness (17.3%), purplish (7.3%) and blister (3%). Most of the mothers (71.4%) used some pain relief method. Nenê Dent® and Camomilina® C were the most used. Only 16% of the mothers reported dental care-seeking.

**Conclusion:** Irritability and swelling were the most sign and symptom present during primary tooth eruption, respectively. Most of the mothers used some pain relief method without visiting a dental professional.



## Risk Factors for Worsening Oral Health-Related Quality of Life in The Transition from Mixed Dentition to Permanent Dentition: A Longitudinal Study

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**Background:** Little is known about the effect of oral problems over time on oral health-related quality of life (OHRQoL). The aim was to evaluate the factors associated with the worsening of OHRQoL after 7 years.

**Methods:** Representative sample of 324 students aged between 13 and 19 years old (follow up), initially evaluated in 2012 (baseline). OHRQoL was assessed using CPQ8-10 and CPQ11-14. The questionnaire scores were converted to be equivalent and the mean difference between the baseline and the follow up was performed. OHRQoL was dichotomized into improvement and worsening. Oral conditions analyzed in a longitudinal way were caries (DMFT / dmft) and malocclusion (DAI), categorized as: absence of the problem in both times; presence of the problem in the baseline and absence in the follow up; absence of the problem in the baseline and presence of the problem in the follow up; and presence of the problem in both times. Socioeconomic characteristics, age and sex were assessed. Poisson hierarchical regression was used.

**Results:** Female students (PR: 1.68; CI95%: 1.07 to 2.63; p = 0.02) and in the age group 17 to 19 years old (PR: 1.82; CI95%: 1.09 to 3.04; p = 0.02) had worse OHRQoL. Malocclusion absent in baseline and present in follow-up represented a 78% higher risk (RR: 1.78; CI95%: 1.1 to 3.19; p = 0.04) of worsening OHRQoL.

**Conclusion:** New cases of malocclusion are risk factors for worsening OHRQoL. Older and female students have a worse OHRQoL.

## The Impact of Early Loss of Primary Molars on the Oral Health-Related Quality of life of Schoolchildren aged 8- to 10-years

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**Background:** The evidence about the impact of early loss of primary molars on the oral health-related quality of life (OHRQoL) of schoolchildren is limited. The purpose of this study was to evaluate the impact of early loss of primary molars on the OHRQoL of schoolchildren aged 8- to 10-years.

**Methods:** A cross-sectional investigation was conducted, with 1456 schoolchildren randomly selected from public schools from Florianopolis (Brazil). Clinical data collection was performed in the school environment, by four calibrated examiners. Dental caries was determined by the DMFT/dmft index and the clinical consequences of untreated caries lesions by the PUFA/pufa index. Dental fluorosis (Dean Index), molar-incisor hypomineralization (European Academy of Pediatric Dentistry criteria), anterior open bite and large overjet (6mm) were also assessed. Parents answered a questionnaire about their family's socioeconomic status. Children answered a questionnaire about demographic characteristics and the Child Perception Questionnaire (CPQ<sub>8-10</sub>). A multilevel Poisson's regression analysis was performed (P<0.05). The impact on OHRQoL was based on a cut-off of 12 points, that represented the median score of the CPQ<sub>8-10</sub>.

**Results:** The prevalence of premature loss of primary molars was 5.83% (n=85) and, among these, 70.6% had poor OHRQoL (RR: 1.42; 95%CI: 1.19-1.68). Females, children whose caregivers had an education of 8 years of schooling, and the presence of untreated caries lesions also negatively impacted the OHRQoL.

**Conclusions:** The early loss of primary molars negatively impacted the oral health-related quality of life of schoolchildren.

## Changes in Knowledge and Attitude after a Health Education Program in Dentally Anxious Children undergoing Comprehensive Dental Treatment

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**Background:** Children are subjected to primary education from a very young age during which they spend quality time with teachers. Hence the aim of this study was to assess the knowledge of teachers, with regards to dental anxiety. The purpose of this study was to convert these children who are dentally anxious into less apprehensive patients in the future.

**Methods:** A total of 214 primary school teachers were approached for the study purpose. The idea behind the survey was explained in detail and data collection was done. Statistical analysis was performed using ' Z ' test as the data was parametric and quantitative in nature.

**Results:** In the knowledge category, the results showed 70.83% improvement after a health education program and in the attitude category, it showed a 90% overall improvement.

**Conclusion:** Our study showed that there was a dearth of information regarding dental anxiety status among children before the dental health awareness program which improved tremendously after the program among primary school teachers, which clearly indicates that more such programs can be planned and conducted on a larger scale. Thus it can cater to the needs of the society by way of Out Reach programs. Health education programs play a major role in contributing towards increasing the knowledge and attitude among primary care takers and thus can be implemented.

## **Discrepancy between Nationally Reported Cleft Dental Outcomes and Local Experience: Getting to the Root of the Problem**

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**Background:** The Cleft Registry and Audit NETwork (CRANE) Database annually reports outcomes of cleft care at age 5yrs. Local cleft dental teams recognised discrepancy between the nationally reported data on dmft / treatment index and that held by the 15 local cleft dental teams in the UK.

**Methods:** National data requires consent to be analysed. Completeness of consent verification and dmft data held nationally (in CRANE) were compared with data held locally by treating cleft dental team for the 5 birth years 2009-13. Gap analysis was performed between the two datasets.

**Results:** Across teams and birth years CRANE Consent verifications ranged from 78.9-99.5% ( 85% for 10/13 teams). dmft data completeness ranged from 31-95.4%. Data shows variation (up and down) when national and local dmft/ treatment index are compared. The maximal difference being 41% difference in treatment index in one year. Consent verification being the primary problem. Dental teams were collecting data and providing to local data managers but it was not all able to be uploaded to the CRANE database due to discrepancy in verified consent.

**Conclusion:** This analysis underscores the need to be vigilant to full national audit process: gaining and recording consent, outcome recording and result validation. Deficiencies in records in a multi-stage system are compound. Insight gained indicate a need for vigilance in other CRANE reported specialty outcome reports. They may also explain why clinicians experience frustration with national audits and underline the need for competent data validation processes.

## Epidemiology

**The Influence of Cleft Type and Socio-economic Deprivation on Caries Experience in Children with Oro-nasal Clefts. Evidence from 4000 patient records on the UK CRANE Database**

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**Background:** Cleft patients are well recognised to be high risk group for the development of caries. What is not well understood is to what extent cleft type and socio-economic deprivation (SED) modify caries risk and treatment thereof in England. This study sought to illuminate this area

**Methods:** CRANE registered cleft births (2004-2013) were linked to Hospital episode statistics (HES) for England. 4000 patients with dental records, cleft type and deprivation status was positively linked. Data were analysed for relationship between dmft / Treatment index /Care index and cleft type /SED

**Results:** SED was equally spread across cleft types. 41% of the cohort had a dmft 0. Where significant caries had been experienced (dmft5), the greater the complexity of the cleft the lower likelihood the disease was treated ( $p=0.006$ ). Similarly, deprivation was negatively associated with the care of dental disease. Those in the most deprived quintile of society having a significantly lower care index than those least deprived quintile ( $p=0.019$ )

**Conclusion:** Children with more complex clefting experience greater dental disease burden and receive less treatment/care. Treatment/care in this cohort follows trends seen in the general population, in that the most deprived patients are least likely to receive appropriate treatment/care. Identified differences presented should help inform public health/cleft teams to adapt preventative/treatment programmes provided to attempt to reduce both overall burden of disease and inequality of its treatment/ care in this high risk population.

## Epidemiology

**Awareness and Attitudes of use of Social Media among Pediatric Dental Professionals and Postgraduate Students in Pediatric Dentistry during COVID 19**

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**Background:** Social media serves as an excellent resource for all health care professionals specially for the pediatric dental professionals to make decisions in their practices. Pediatric dentists using social media for professional purposes need to be aware of the uses as well as the challenges it presents.

**Methods:** A self-structured validated questionnaire was distributed among the pediatric dental professionals through google form using a combination of snowball and convenience sampling. The questionnaire was divided into 3 sections: the 1st one contained personal information, whereas 2nd and 3rd sections assessed the attitude and awareness of the dental professional. The level of significance was fixed at 5%, Power of the study was kept at 95% with sample size 869. The data obtained was analysed by SPSS software and applying appropriate statistical test.

**Results:** It was found that a majority of dental professionals under 40 years of age used social media in the current pandemic for communication with patients/ parents. Analysis of the questionnaire revealed an increase in screen time for academic and educational purposes mainly amongst the postgraduate students. A sharp rise in teleconsultation was seen which was almost non-existent before the pandemic.

**Conclusion:** Although social media use has increased for academic as well as communicating with patients in the current pandemic, it does have its limitations and pitfalls which the current study attempts to understand and highlight.

## **Mortality in the First 100 Days of COVID-19 in Brazil, Italy, Portugal, United Kingdom and United States: Exploring Economic, Educational, Health and Social Isolation Perspectives**

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**Background:** Mortality data as an indicator stands out for its greater availability from the mandatory registration of all deaths for most countries and seeking to understand the context and the disease course is truly relevant for an adequate health response.

**Methods:** The Gini index, gross national income (GNI), the Programme for international student assessment, Global education indicators 2019, public health expenditure, hospital beds and physician's density per 1000, COVID-19 testing, intensive care unit (ICU) beds and patients, Google and Facebook isolation data were considered.

**Results:** At one hundred days, mortality ranged from 1485 in Portugal to 50,492 in the USA. The Gini index and GNI per capita, respectively, ranged from 53.3% and US\$9,080 in Brazil to 34.8% in the UK and US\$63,170 in the USA. Educational indicators were lower in Brazil. Hospital beds and physician density ranged from 2.2 for both factors in Brazil, to 4.7 in USA hospital beds and 5.0 in Portugal physician densities. Health expenditure was lower in Italy, higher in the USA. COVID-19 testing, ICU beds and patients were higher in the USA. Isolation data revealed varied percentage changes in relation to baselines. Portugal started isolation measures earlier and presented the most flattened COVID-19 mortality curve.

**Conclusion:** It was concluded that besides presenting favourable economic, educational and health indicators, early adherence to social isolation measures, may have contributed to Portugal's good management of the COVID-19 outbreak.

**Prematurity as a Contributing Factor to Malocclusion: Results of a Retrospective Cohort**

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**Background:** Although malocclusion has been associated with prematurity, studies with more robust designs must be conducted to confirm a causal relationship. The objective was to evaluate the effect of prematurity and NICU hospitalization during the neonatal period on the incidence of malocclusion in the primary dentition of premature children compared to children who were born at term.

**Methods:** A sample of 150 children aged 2 to 6 years divided into 3 groups (G1: Children at term; G2: Premature; G3: premature infants admitted to the NICU) was assessed using the criteria of Foster and Hamilton (1969) for malocclusion. Neonatal data were collected through hospital records. Data such as pregnancy complications, gestational age, weight and date of birth, reason for hospitalization, length of hospital stay and intubation were collected. In addition to sociodemographic data, data related to oral health and habits were also collected through a questionnaire. Poisson hierarchical regression was used.

**Results:** Low child weight at birth, (RR = 0.15; 95% CI = 0.02-0.88 p = 0.036), lower gestational age and NICU admission (RR = 5.60; 95% CI = 1.06-9.47 p = 0.042), presence of suction habit (PR= 4.25; 95% CI = 1.26-9.36 p = 0.020) and the suction frequency (RP= 5.76; 95% CI = 2.34-7.19 p 0.001) were significantly associated with the presence of malocclusion.

**Conclusion:** Prematurity, hospitalization in the NICU, low weight, presence of the non-nutritive sucking habit and high frequency in performing it, are factors directly associated with the presence of malocclusion.



**Non-Nutritive Sucking Habits Associated with a Worsening of Preschoolers` Masticatory Performance**

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**Background:** Chewing is very important for children growth and development. The aim of this study was to evaluate the association of current nutritive and non-nutritive sucking habits with the masticatory performance (MP) in preschoolers.

**Methods:** A cross-sectional study comprising 384 children aged three to five years from public schools was carried out in Diamantina / Brazil. A single calibrated examiner performed all oral examination (Kappa 0.82). The presence of malocclusion was recorded using the Foster and Hamilton criteria. The number of masticatory units and the presence of cavitated caries in posterior teeth were also recorded. Parents answered a questionnaire addressing questions about the child`s current nutritive and non-nutritive sucking habits and also filled out a dietary recall to record food`s consistencies. The MP was evaluated using the Optocal test material and was based on the median particle size (X50). Data analysis involved simple and multiple Linear Regression, and the confidence level adopted was 95%.

**Results:** Multivariate linear regression showed an association between age (B = - 0.288; p = 0.026), pasty dietary consistency (B = -0.511; p 0.001), pacifier sucking (B = + 1,176; p = 0.026) and posterior cavitated caries.

**Conclusion:** Children who used a pacifier had a worse MP than those who had never used a pacifier, regardless of confounding variables.

## **Obstacles and Opportunities in Improving Knowledge of Mothers Concerning Children Dental Growth and Development in Poor Community**

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**Background:** A mother's knowledge during pregnancy is important so as to maintain their child's dental health during the first 1000 days of life. The number and coverage of public health services have been set to promote the oral health of mothers, but so far, it does not give a significant result in Indonesia. The aim of this study was to determine obstacles and opportunities to increase the knowledge and ability of mothers for taking preventive actions on dental and oral disorders in children.

**Methods:** The locations of research were in Sampang, Malang and Surabaya, East Java Province of Indonesia. Data was collected from in-depth interviews using questionnaire from 300 respondents of expectant mothers and mothers of children under five years old, as well as community health volunteers from the Public Health Center and local community leaders in poor communities in the study area.

**Results:** Expectant mothers did not receive, or received very little information about children's dental growth and development. The obstacles were a lack of knowledge of community health volunteers and facilities to support health promotion in the study areas. Health programs with a gender perspective approach towards women in poor areas, will provide better results, especially with reference to dental and oral health in children.

**Conclusions:** The obstacles were a lack of knowledge of expectant mothers, community health volunteers, and facilities to support health promotion in the study areas. It needs to be improved by giving more focused dental health lectures at the community meetings and mass media, and by increasing the facilities of public health services.

## Undergraduate Clinical Dental Students' Knowledge and Perception Regarding the Novel Covid-19 in Nigeria

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**Background:** Coronavirus disease 2019 (COVID-19), is an infectious disease that has become a major Public Health Emergency of International Concern. This study aimed to assess the knowledge and perception of COVID-19 among Nigerian dental students, and its impact on their academic life.

**Methods:** A web-based questionnaire assessing knowledge and perception, was created using Survey Monkey, with a total of 46 scoreable responses. We surveyed 178 out of 507 clinical dental students attending 10 dental schools. Bivariate analysis was conducted to test the association between students' sociodemographic and knowledge of COVID-19 infection. Logistic regression was conducted to determine the predictors of having good knowledge of COVID-19, P 0.05.

**Results:** The mean knowledge score of the dental students about infection control and COVID-19 was 32.19 (SD: 7.30, Range: 2-46). The linear regression analysis showed that male (vs. female,  $\beta$ : 0.242, P0.001), age-group of 18-24 years (vs. 45-54 years,  $\beta$ : -0.305, P0.001), class level 600 (vs. 500 level,  $\beta$ : -0.154, P0.001), previous lectures on infection prevention/control (vs. no lecture,  $\beta$ : -0.186, P=0.007), and a high-risk perception (vs. low-risk perception,  $\beta$ : 0.220, P=0.001) were significantly associated with higher knowledge scores.

**Conclusions:** The students were knowledgeable about the mode of transmission, complications, and diagnosis of COVID-19 but had limited understanding of the precautionary measures against COVID-19. They also had inadequate supplies of PPEs. These results address the need for an update of the infection prevention/control curriculum for dental students, improved quality assurance, as well as adequate provision and training in the use of PPEs.

**Dental Caries Status of 6-year old Children in Northern Cyprus**

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**Background:** Dental caries is a multifactorial, chronic disease which can be classified as a major public health problem among developing countries. This aim of this study was evaluate the dental caries status of 6-year old children in Northern Cyprus.

**Methods:** Calibrated and trained paediatric dentists examined a total of 425 6 year-old children (210 females, 215 males) according to World Health Organization criteria (2013). Dental status was evaluated using the decayed, missing, filled tooth (dmft) index for the deciduous dentition. Data were statistically analysed using Chi-square test.

**Results:** 86.8% of the children had dental caries with a mean dmft value of 5.90. A correlation between gender and dental status was found ( $p < 0.05$ ). The percentages of decayed, missing, filled primary teeth were 86.8%, 15.5% and 17.2% respectively.

**Conclusions:** The results of this study revealed that children in Northern Cyprus at the age of six suffer high rates of dental caries, which could be improved by adoption of preventive therapies.

## A 2-year Review of General Anaesthesia Paediatric Procedures Undertaken at a North London Oral and Maxillofacial Unit

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**Background:** Dental treatment remains one of the most common reasons for paediatric patients to undergo general anaesthesia (GA). There have been many studies investigating dental GA. Oral and Maxillofacial (OMF) surgeons are affiliated with some of this well-reported dentoalveolar surgical activity. The literature to date has shown that the majority of paediatric GAs are for treatment of decayed teeth. The aim of this study is to evaluate the reasons children undergo GA procedures in an OMF department and investigate possible associated demographic factors.

**Methods:** Patients managed from 2016-2017 between the ages of 0-16 were included. Electronic hospital notes were used to collect retrospective data on paediatric OMF procedures performed under GA. Procedures were categorised into 10 procedure types. Patient details including age, gender and ASA status were obtained. Deprivation was calculated from postcode using the Index of Multiple Deprivation.

**Results:** Data from 600 children undergoing 790 procedures were analysed. The most common age group treated at the hospital were the 13-16-year-old cohort. There was a similar number of males and females treated. 89.5% of the patients were ASA I. The most common clinical procedures were found to be simple orthodontic extractions, making up almost a quarter (24.4%) of all procedures.

**Conclusions:** In the region studied, more paediatric patients are undergoing GA for orthodontic-related surgery rather than caries. The majority of paediatric patients were ASA I. Epidemiology studies of OMF paediatric GA is important to effectively plan and deliver regional health services.

**Shift in Paradigm of Treatment Needs Post COVID Lockdown in India: A Mathematical Model-based Study**

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**Background:** The COVID-19 pandemic has brought all treatments other than emergencies to a halt. However, dental disease being a multifactorial microbial disease is capable of progressing to pulpitis and its sequelae. The purpose of this study is to predict the progression and accumulation of treatment needs in children during the lockdown and partial lockdown in India (Mysore).

**Methods:** This study uses a mathematical model and outpatient department data from the year 2019 from the Department of Pediatric and Preventive Dentistry, JSS Dental College. A table of treatments provided in 2019 was prepared. Care-seeking rates of 25% and 50% were assumed and modeled, corresponding to each stage of the lockdown as national and local policies permitted only emergency treatments. Dental caries progression was calculated based on shifts in treatment needs from permanent restorations, to temporary restorations or pulpectomies or extraction, assuming a 10% progress to each sequela due to neglect.

**Results:** The number and severity of cases were projected to have increased based on the assumptions of progression of disease used in the mathematical model. However, after removal of lockdown, it was noted that the number of patients seeking care were significantly less than the 25% assumed to report to the pediatric department.

**Conclusion:** The projected progression of dental disease adds to the burden on society and caregivers due to progression of disease states and increased cost of treatments.

**Prevalance of Molar Incisor Hypomineralization in Northern Cyprus at the age of Six**

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**Background:** Molar incisor hypomineralization (MIH) is defined as developmentally-derived dental defect which affects one to four first permanent molars and at least one permanent incisor. The aim of this study was to determine the prevalence of MIH in children at the age of six in Northern Cyprus.

**Methods:** A total of 425 (210 females, 215 males) at the age of six were examined by trained and calibrated paediatric dentists according to EAPD criteria for MIH. Statistical analyses were performed with chi-square test (p0.05).

**Results:** MIH was detected in 26 (13 M, 13 F) children, with no significant difference noted between sexes (p0.05). The prevalence of MIH was assessed as 6.1%.

**Conclusions:** According to the literature, the prevalence of MIH ranges between 2.2%-40.2% worldwide. The prevalence of MIH can differ due to etiological factors. Further research is needed to evaluate the etiological factors in Northern Cyprus.

## Dentist's Knowledge, Perception of Fear and Practice Modifications Related to Covid-19 in Pediatric Dentists of Delhi-NCR

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**Background:** The rapid spread of coronavirus (COVID-19) has challenged all the health professionals and has changed the system of providing healthcare to great extent. Pediatric dentists have critically been affected by this pandemic such that all routine dental practices have been arrested.

**Methods:** A descriptive cross-sectional study was conducted in Delhi-NCR in the month of May 2020, through a 40-item self-administered, closed-ended pre-tested questionnaire using Google Forms in which 115 questionnaires were collected back out of 150 pediatric dentists that were included randomly. Questionnaires tabulated using Microsoft Excel and then analyzed using Statistical Packages for the Social Sciences (SPSS), version 25.0 software (SPSS Inc., Chicago). The test for significance to find out the association between various variables was done using Chi-square test.

**Result:** A total of 115 pediatric dentists participated in the study in which out of all the participants, 108 (94%) were less than 30 years of age. 83.48% of participants were afraid of getting infected with COVID-19 from either a patient or a co-worker. 97.39% of participants were aware of its mode of transmission, and 95.65% were updated with the current CDC or WHO guidelines for cross-infection control. 94.78% preferred asking about the patient's travel history, 80.87% recorded every patient's body temperature before performing dental treatments, and 75.65% deferred dental treatment of patients who disclosed suspicious symptoms.

**Conclusion:** The majority of pediatric dentists had good knowledge and attitude regarding dental practices related to Covid-19, yet they need to overcome their fear and modify their conventional patient management techniques.



### Longitudinal Evaluation of Determinants of the Clinical Consequences of Untreated Dental Caries in Early Childhood

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**Background:** A large portion of children don't have access to the dentist, which favours its progression, resulting in clinical consequences, such as pulpal involvement and the development of mucosal lesions (ulceration, fistula, and abscess). Objectives: This study aimed to evaluate whether trajectory of family income, parental education and clinical variables, are associated with the presence of the clinical consequences of untreated dental caries among children.

**Methods:** A prospective cohort study was conducted with 439 children evaluated between one and three years of age at baseline and re-evaluated after three years. Sociodemographic and economic variables, dental caries and biofilm were investigated both baseline and follow-up. The pufa index (pulpal involvement, ulceration, fistula and abscess) was used to diagnose of the clinical consequences of untreated dental caries.

**Results:** The prevalence of  $pufa \geq 1$  was 18.2%. The following variables were associated with the presence of pufa: low mother's schooling at baseline and follow-up (RR= 1.51; 95% CI: 1.04-2.18), the incidence or presence of biofilm at baseline (RR= 4.66; 95% CI: 2.02-10.74) as well as cavitated dental caries at baseline (RR= 3.57; 95% CI: 1.86 to 6.83) and incidence of cavitated dental caries (RR= 2.04; 95% CI: 1.24-3.35).

**Conclusion:** Low mother's schooling, biofilm, cavitated dental caries at baseline, and the incidence of dental caries were determinants of the consequences of untreated dental caries.

**Medicolegal Awareness among Dental Professionals in Pune, India: A Questionnaire Based Study**

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**Background:** With technology moving in fast forward, practice of dentistry has undergone a sea change. Alongside, there has been a growing public concern regarding the ethical conduct of healthcare professionals. This is often reflected as complaints about poor ethical conduct and an increasing use of litigation against healthcare practitioners. The main objectives of this research study were to assess the knowledge and perceptions of dental professionals on ethics, confidentiality and medico-legal issues.

The Aims and Objectives are to obtain information on knowledge and perception of dental professionals on ethics, confidentiality and medico legal issues through a questionnaire based on objective questions.

**Methods:** A self structured validated questionnaire designed to support the study was given to 390 practicing dental professionals aged 22-70 years from Pune, India. The dental professionals were asked to answer the questionnaire designed to assess the knowledge, awareness, and perception on ethics and medico legal issues. All answers were kept confidential. The data was subjected to SPSS, version 16 and statistically analysed.

**Results:** Majority of the practitioners were taking verbal consent from the patients before procedures with no differences in gender. Knowledge about COPRA was more in practitioners practising since upto 10 years. Practitioners with older practices had lesser awareness of the same.

**Conclusion:** This study emphasized on a comprehensive understanding of the medicolegal aspects of dentistry.

## Perception of Parents and Children on the Impact of Molar and Incisor Hypomineralization related to Oral Health Related Quality of Life

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**Background:** To date, few studies have evaluated the perception of parents and children regarding the impact of molar incisor hypomineralization (MIH) on the oral health related quality of life (OHRQoL) in schoolchildren. The main target of this study was to investigate the perception of parents and children and the impact of MIH on the OHRQoL.

**Methods:** An observational study was conducted with a group of 253 children aged 6 to 12 years old presenting MIH and their parents or guardians who initially answered an interview containing socioeconomic and demographic questions as well as the Parental–Caregiver’s Perceptions Questionnaire (P-CPQ). The children answered the Child Perceptions Questionnaire (CPQ8-10) and Child Perceptions Questionnaire (CPQ11-14) and the clinical evaluation of MIH was performed. Poisson regression with robust variance was used in the data analysis.

**Results:** The parents` perception showed that the impact felt by the children regarding caries leads to a higher oral symptom impact, functional limitation, emotional well-being and total PCPQ score domains, as well. For children with severe MIH, a higher prevalence of impact was felt regarding the functional limitation and emotional well-being. For CPQ8-10, the oral symptoms domain presented the highest mean score while CPQ11-14 showed the functional limitations domain and P-CPQ the emotional well-being domain.

**Conclusion:** Considering the perception of parents or guardians it was concluded that MIH promotes a negative impact on the OHRQoL. MIH had no significant impact on the OHRQoL according to children’s perceptions.

**Impact of Sleep Bruxism on Teenagers' Sleep Quality: A Seven-Year Longitudinal Study**

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**Background:** Poor sleep quality can affect students' daytime activities. This study's aim was to observe the impact of sleep bruxism (SB) on teenagers' sleep quality.

**Methods:** Longitudinal study was carried out with a representative sample of Brazilian teenagers, aged between 13 and 18 years old (n = 336). The adolescents' guardians answered questions related to sleep through the Sleep Behavior Questionnaire. The SB was the only longitudinal evaluation, measured according the report of those guardians (possible SB) and oral clinical examination (probable SB), categorized as: absence of SB in both times; presence of SB in the baseline and absence in the follow up; absence of BS in the baseline and presence in the follow up; and presence of SB in both times. At the follow-up, habits such as biting objects, biting nails and mouth breathing were evaluated. Poisson regression hierarchical model was used.

**Results:** Sleep problem average was 48.2 (+ 9.47). Unadjusted analysis showed an association of females (p 0.01); biting nails' habit (p = 0.04); presence in both moments of possible SB (p = 0.01) and probable SB (p = 0.04), and mouth breathing (p 0.01). Adjusted analysis remained associated the female gender (PR: 1.10; p 0.01); possible longitudinal SB (RR: 1.09; p = 0.02) and mouth breathing (PR: 1.05; p = 0.04).

**Conclusions:** Teenagers who present possible SB as a longstanding habit have a significant impact on their sleep, with a greater risk of having more sleep problems than those who do not accumulate this habit.

Cariology and Preventive Dentistry, Epidemiology

**To Investigate the Effect of use of ICDAS -2 and WHO + ECL Caries Detection Methods on the Prevalence of Dental Caries in Primary Teeth: A Pilot Study**

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**Background:** To investigate the effect of use of ICDAS -2 and WHO caries detection methods on the prevalence of dental caries in mixed dentition : A pilot study

**Methods:** 150 children in the age group of 6-12 years were examined twice using ICDAS-2 and WHO caries detection methods by two calibrated examiners. Average time taken to examine by both methods was noted.

**Results:** 10 children had a code of 00 in their dental surfaces. None of the individuals had any restorations or extraction due to dental caries. Good intra and inter examiner kappa co-efficient were obtained for both the methods. The average time to examine each patient using ICDAS -2 method was more than that of WHO method

**Conclusions:** The new system, ICDAS -2, provides more accurate information than WHO method for the investigators and epidemiologists.

**Possible Sleep Bruxism Associated with Smartphone Use, Sleep and Life Satisfaction among Adolescents**

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**Background:** Sleep bruxism is a muscle activity during sleep characterized by grinding the teeth and/or by bracing or thrusting the mandible. It is associated with sleep characteristics and emotional factors. The aim of this cross-sectional study was to evaluate the association between the different activities of possible sleep bruxism (PSB) and sleep features, life satisfaction and smartphone use.

**Methods:** A total of 403 adolescents, aged 12 to 19 years, from Belo Horizonte, southeast Brazil, answered a questionnaire evaluating the severity (mild, moderate/severe) of PSB bracing/thrusting (PSB-BT) and grinding (PSB-G) activity, sleep quality and duration, and smartphone use. Adolescents also answered three domains (self, self-compared, self-efficacy) of the Brazilian version of the Multidimensional Life Satisfaction Scale for Adolescents. Descriptive analysis and Multinomial Logistic Regression were performed with a 5% significance level.

**Results:** Most adolescents were female (58.1%). Their mean age was 14.3 years ( $\pm 1.5$ ). Prevalence of mild PSB-BT was 17.1% and moderate/severe PSB-BT was 4.2%. Adjusted model showed that adolescents who reported poor/reasonable sleep quality (OR= 2.584; 95% CI = 1.423 – 4.692), who sometimes used the smartphone with the lights off before sleeping (OR= 3.815; 95% CI = 1.203 – 12.100) had a higher chance to present mild PSB-BT. Adolescents who reported poor/reasonable sleep quality (OR= 2.243; 95% CI= 1.237 – 4.070) had a higher chance to present mild PSB-G. No association was found between PSB and life satisfaction domains.

**Conclusion:** Poor/reasonable sleep quality and using the smartphone with the lights off before sleeping were associated with possible sleep bruxism activity.

## Evaluation of a Video in a Local Language on Adult Females' Knowledge of Reversal of Teeth Eruption Sequence in Children

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**Background:** Children with reversed sequence of anterior tooth eruption in Nigeria are often stigmatized and the teeth forcefully extracted by charlatans. This study aimed to assess the effectiveness of a video on mothers' knowledge, attitude, and intended practices towards children with reversed sequence of anterior tooth eruption.

**Methods:** This study was conducted among 300 mothers randomized into intervention and study groups in Ibadan, Nigeria. A 23 -minute video titled "Baba yoyin" developed to dispel myths regarding reversed eruption sequence was shown to participants in the intervention group. Participants in the control group were educated on practices of good oral health for children. Data was collected using a pretested 13-item questionnaire and was analyzed with SPSS and Wilcoxon Signed Ranks test.

**Results:** The mean age of participants in the intervention and control groups were  $29.2 \pm 5.0$  years and  $29.4 \pm 6.0$  years respectively ( $p = 0.696$ ). When attitude and knowledge items were given a score of 1 for correct responses and 0 for wrong answers, there was a significant difference in the pre and post-intervention scores in the intervention group (Mean ranks = 33.50, Sum of ranks = 556.30,  $Z = 4.879$ ,  $p = 0.001$ ). In the control group no difference existed in the pre and post-intervention scores (Mean ranks = 13.64, Sum of ranks = 95.50,  $Z = 1.905$ ,  $p = 0.057$ ).

**Conclusion:** "Baba yoyin" significantly improved the knowledge of causes and attitudes of participants towards infants with reversed sequence of tooth eruption.

## Dental Caries Status and Dental Service Utilization of Pregnant Women across Different Socio-Economic Groups

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**Background:** Early Childhood Caries (ECC) is a multifactorial disease; risk factors include maternal dental caries status and access to dental services. The aim of this study was to determine and compare pregnant women's dental caries status and dental service utilization across socio-economic groups (SES).

**Methods:** This cross-sectional analytical study involved consenting pregnant women from randomly selected private and public antenatal healthcare facilities in Tshwane District, South Africa. It involved a validated self-administered structured questionnaire and an oral clinical examination using the modified WHO Oral Health Assessment 1997 Guidelines. The questionnaire recorded socio-demographic data, dental service utilization and barriers to dental visits. Analysis included mean, frequencies, Chi-squared statistics and independent student's t-tests to compare different groups.

**Results:** The participants' caries prevalence was 64.3% (n=353; mean age = 31 years). Mean DMFT was 2.97(SD 3.20). The private healthcare facility attendees had significantly less DMFT compared to those of public healthcare facility (DMFT: 2.45 and 3.32 respectively). The private healthcare facility attendees were more likely to be employed, have higher household income and higher educational attainment. Few participants (19.3%) reported a dental visit in the last 6-months. However, majority (79.6%) claimed no problems in accessing a dental facility. Those who reported access problems had higher DMFT (more missing teeth). Cost was the main barrier to access services.

**Conclusion:** High DMFT was associated with lower SES. The type of healthcare facility attended mirrored the participants' SES. Dental service utilization was low across SES with cost as the main barrier. Prenatal dental visits and education needs to be encouraged.



## Evaluating the Impact of Lifestyle Changes on Oral Health during COVID19 Pandemic: A Questionnaire-Based Study

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**Background:** After the outbreak of COVID 19 there was a change in the lifestyle due to the lockdown all around the world. The purpose of this study was to evaluate the effect of life style changes during COVID19 pandemic on oral health of parents and their children.

**Methods:** Data is being collected through an online on-going questionnaire-based survey on lifestyle changes during COVID 19 pandemic across the country.

**Results:** Ongoing survey shows that 0.05% of the parents and children report deterioration in their oral hygiene practice and 20% of parents and 22% of the children report improvement in their oral hygiene practices. 92.6% reported no difficulty in obtaining oral hygiene products. 28% of parents 46% of children have reported an increase of in-between meal snacking. 55% of the parents and 53% of the children reported an increase in sleep during lockdown. 76% of the children have a habit of using electronic media during meal-time. 66% of the children and 59% of parents responded that their electronic use has increased during the lock-down. 17% of the parents and 25% of the children responded to be suffering from dental decay, 11% of parents and 8% of children suffer from pain in their oral cavity during lockdown.

**Conclusions:** To conclude there was no deterioration of oral hygiene measures, while in-between meal snacking and increase in use of electronic media during mealtime also one fourth of the child population had existing decayed teeth which may predict the increased risk for development of dental caries.

**Early Childhood Oral Health Impact Scale (ECOHIS): A Validation Study**

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**Background:** The concept of dental health related to the quality of life involves the impact of oral health on the wellbeing of an individual. The Early Childhood Oral Health Impact Scale (ECOHIS) was developed to measure the impact of oral health complications on the life of children and their families. Objective: To estimate the psychometric properties of ECOHIS applied to mothers of pre-school children.

**Methods:** The sample consists of mothers of pre-school children (mean age = 5.0 (SD = 0.6) years; 51.5% male) enrolled in the Brazilian public-school system. The construct validity of ECOHIS was estimated using confirmatory factor analysis (ratio of chi-square to degrees of freedom ( $X^2/df$ ), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and factor loadings ( $\lambda$ )). The reliability was estimated using ordinal alpha ( $\alpha$ ) and omega ( $\omega$ ) coefficients. The measurement invariance in independent samples was estimated by multigroup analysis using the CFI difference ( $\Delta CFI$ ).

**Results:** Participated in the study 371 mothers (mean age = 33.0 (SD = 7.04) years). The factorial model of ECOHIS presented adequate fit to the sample ( $\lambda = 0.65-0.88$ ;  $c^2/df = 4.31$ ; CFI = 0.95; TLI = 0.94; RMSEA = 0.09). There is a strict invariance between independent samples ( $\Delta CFI 0.01$ ).

**Conclusion:** The data obtained with the ECOHIS model were valid, reliable and invariant for independent samples.

**Oral Health Conditions in Children with Mouth Breathing and Nasal Breathing: A Case-Control Study**

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**Background:** Mouth breathing is the prolonged breathing through the mouth alone, or in a mixed pattern through the mouth and nose. The prevalence of mouth breathing in children is 50%-56%. This study assessed and compared the oral health conditions, occlusal relationships and oral microflora of pre-school children with mouth breathing and nasal breathing.

**Methods:** This case-control cross-sectional study recruited 35 pre-school children aged 3 to 6 years old with mouth breathing (MBr) from randomly selected pre-schools in Hong Kong. A sample of 35 age- and gender-matched nasal breathers (NBr) was recruited as control. Clinical data on dental caries, gingival health, oral hygiene level, occlusal relationship and salivary bacterial count were collected and compared between groups. Information about children's socio demographic background, breathing-related characteristics and oral health behaviours were obtained by a parental self-completed structured questionnaire.

**Results:** MBr had significantly poorer oral hygiene than NBr (P0.05). They had more moderate and extensive carious lesions than NBr according to the ICDAS scores (P0.05). No significant differences in gingival health, salivary bacterial counts (*Streptococcus mutans* and *Lactobacilli*) and occlusal relationships were observed between the two groups.

**Conclusions:** Pre-school children with mouth breathing had poorer oral health in terms of oral hygiene and dental caries than those with nasal breathing. Dentists should be aware of the implications of mouth breathing on the oral health of pre-school children and play an active role in providing preventive programmes and regular dental follow up to maintain good oral health in children with mouth breathing.

### **Impact of COVID-19 in Paediatric Dentistry**

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**Background:** The novel Coronavirus Disease-2019 (COVID-19) has spread rapidly over the world resulting in a global pandemic. The disease outspread is still increasing due to the nature of community transmission. The disease transmission occurs predominantly through respiratory droplets inhalation or through the contact with mucous membranes and contaminated surfaces/objects. Among the health care professionals, dentists seem to be at higher risk of contracting the disease due to the vicinity to the patient's oropharyngeal region and aerosols generation during the dental procedures. The risk is even higher with pediatric patients since the affected children mostly present with asymptomatic mild to moderate symptoms. The unpredictability of COVID-19 infection in children along with the reports of SARS-CoV-2 (severe acute respiratory syndrome coronavirus-2) carrier status and the difficulty in diagnosing symptoms raises problems. The objective of this study is to evaluate the risks and challenges faced by a pediatric dentist during COVID-19, infection control measures and preventive and therapeutic measures of oral health care to reduce the risk of viral cross-infection.

**Literature review:** The electronic database Google Scholar and PubMed were used to search the literature for relevant studies. Six studies which fulfilled our inclusion criteria were included in this review. The included studies showed various challenges and risks faced by pediatric dentists and necessary awareness measures to prevent the risks of transmission of COVID-19 during the treatment procedures.

**Conclusion:** This review showed management of children is challenging with the risk of infection during COVID-19 and the avoidance of aerosols generating procedures is suggested.

### **The Care of the Children at Risk at the Dental Consultation and Treatment Center of Casablanca in Morocco: Parents Satisfaction Survey**

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**Background:** Dentists in pedodontics encounter a huge number of children with systemic conditions. The relationship between oral health and general health is close and well known now. Parent`s satisfaction is a significant indicator in the care results. Such an approach is part of a quality process allowing to target the changes to be made in order to optimize the care in the service of pedodontics. The study aims to rate the parental satisfaction of children at risk according to the care provided to them in the service of pedodontics in Casablanca

**Methods:** this cross-sectional epidemiological survey was conducted on 212 children at risk. This study was made up by patients followed up withing the pediatric dentistry service in Casablanca for 3 months. Parents were asked to complete a questionnaire during each visit that dealt with the different dimensions of satisfaction.

**Results:** according to this study it appears that: 76% of the parents thought that the treatment received were appropriate, 90% of the parents will definitively recommend the service of pedodontics to other people and parents were more aware of the service around the care (delay of appointment, kindness..) than the dental treatment itself.

**Conclusion:** Several studies have been conducted showing the satisfaction of the care provided in a dental center. The measured satisfaction does not make sense. It should rather generate feedback improving the treatment performance of the health facilities.

**Does Dental Anxiety Exert an Impact on Oral Health-Related Quality of Life among Pregnant Women?**

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**Background:** Pregnant women undergo hormonal, physical and emotional changes that can have a negative impact on oral health. The purpose of the present study was to investigate the impact of dental anxiety on OHRQoL among pregnant women.

**Methods:** A cross-sectional study was conducted involving pregnant women at public healthcare services in a city in southern Brazil. OHRQoL was measured using the Oral Health Impact Profile (OHIP-14). A semi-structured questionnaire was administered to collect data on demographic, socioeconomic and behavioral factors. The level of dental anxiety was measured using the Dental Anxiety Scale (DAS). A multi-level Poisson regression model was employed, with the calculation of rate ratios (RR) and respective 95% confidence intervals (CI).

**Results:** Two hundred fifty-six pregnant women participated in the study. The mean total OHIP-14 score was 8.74 ( $\pm$  9.00). Mean domain scores ranged from 0.66 for functional limitation and 2.20 for psychological discomfort. The non-white race (self-reported), gingivitis, <sup>3</sup> one decayed surface and DAS <sup>3</sup> 15 were associated with higher OHIP-14 scores in the unadjusted analysis. After adjustments, pregnant women with gingivitis and those with DAS <sup>3</sup> 15 were 34% and 36% more likely to report a negative impact on OHRQoL, respectively.

**Conclusion:** The present study showed that pregnant women with high dental anxiety and those with gingivitis were more likely to report a poorer OHRQoL.

### Nanotechnology in Diagnosis and Treatment of COVID-1

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**Background:** The COVID-19 pandemic, caused by SARS-CoV-2 virus began in December 2019 in Wuhan, China. As on 3:17pm CEST, 6 August 2020, the virus has infected about 18,614,177 people and caused approximately 702,642 deaths. Several antiviral drugs and immunomodulators are under clinical trials but no drug or vaccine have been approved so far against this deadly pandemic. Presently, computed tomography, Reverse transcription PCR and 'nanotechnology' in particular is used for diagnosis and therapy for COVID-19.

**Literature Review:** Various approaches, especially nanotechnology, is being used for the detection of a patient with a very low viral load and for the design of vaccine carriers. A broad range of active moieties including antivirals, biologic medicine, and nucleic acids can be loaded and delivered by means of nanocarriers. This approach needs to be dealt with in reformulating approval as well as improvement of the therapeutic index when doing drug trails, predominantly by addressing the limitations associated with the drug moiety, and mitigating the conventional toxicity or side effects.

**Conclusion:** Nanotechnology tools can play a vital role in advancing COVID-19 treatment and vaccine development which can make the induction of therapeutics safer and more effective.

## Dental Caries Morbidity Stages Association of with Oral Health-Related Quality of Life in Brazilian Preschool Children

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**Background:** Few studies have investigated the association of caries morbidity stage in preschool children and the impact on oral health related quality of life (OHRQoL). This study aimed to assess the impact of caries on the OHRQoL of pre-school children using the Spectrum and Treatment of Caries Assessment (CAST) instrument.

**Methods:** A cross-sectional study was carried out with 210 children aged 2 -to-5 years enrolled in preschools in Capão do Leão, Southern Brazil. A questionnaire containing demographic, socioeconomic, and child-related issues was sent to all guardians. The stage of severity of dental caries was assessed using CAST. OHRQoL was measured using the Early Childhood Oral Health Impact Scale (ECOHIS). The impact was considered when ECOHIS  $\geq$  1. Chi-squared tests and Poisson regression analysis were used to analyze data (p0.05).

**Results:** Morbidity stage was the most prevalent caries condition in children (37.68%). After adjustments for clinical and socioeconomic variables, dental caries morbidity stage was associated with OHRQoL: children with morbidity stage had a 2.13 higher prevalence of impact (PR=2.13; 95%CI=1.21-3.77) and those with severe morbidity had a 3.09 higher prevalence (PR=3.09; 95%CI=1.59-5.97) than children without caries. The presence of dental caries among children (CAST 4-7) was shown to be associated with a greater impact on nearly all domains assessed by ECOHIS (p0.05).

**Conclusions:** The impact of dental caries on the OHRQoL was high in this sample of Brazilian preschoolers. Children with cavitated carious lesions in dentin (morbidity), and with pulp involvement and abscess/fistulas (severe morbidity), was much more affected than children without caries or with premorbidity stage lesions (enamel lesions)



**Clinical Evaluation of Signs and Symptoms of Temporomandibular Disorder in Children**

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**Background:** High rate of harmful habits in childhood may be neglected by parents and caregivers. Temporomandibular disorders (TMD) do not have defined etiology and psychological factors. Signs and symptoms can be characterized by muscle and joint pain, limitation and deviation in mandibular trajectory, joint noises during mouth opening and closing, headaches, neck and ear pains. The purpose of this cross-sectional study was to verify the occurrence of signs and symptoms of temporomandibular disorder and/or bruxism in children from the integrated child dental clinic of the State University of Maringá.

**Methods:** 148 medical records of children aged ranged 5 -12 years, both genders, were evaluated. Patients with congenital malformations and history of mandibular fractures were excluded. Clinical evaluation and a parafunctional habits' questionnaire were performed by a single examiner searching for TMD signs and symptoms. The data was descriptively analysed

**Results:** The children's average age was 9.25 years and were mainly in the period of mixed dentition. 31 children with a diagnosis suggestive of TMD and/or bruxism were registered, constituting an occurrence of 20.95%. Of these children, 12.83% were male and 8.11% female.

**Conclusion:** It's important to detect presence of parafunctional habits to interpose treatment measures as early as possible, in order to promote the health of these patients at the most opportune time.

**Infection Prevention and Control in a School-Based Dental Project in Bradford (PLATOON)**

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**Background:** The Bradford Smile Study/PLATOON is a school-based dental project that aims at understanding the impact of Premature Loss of Primary Teeth On the Orthodontic Need (PLATOON). Children aged 8-12 years taking part in the Born In Bradford study were invited to participate. Data collection took place in primary schools in Bradford and includes dental examination and taking orthodontic records (extra- and intra-oral orthodontic photographs, upper and lower impressions, and bite registration). During data collection, contact with saliva is unavoidable; which may act as a source of infection. Thus, following infection prevention and control (IPC) measures is crucial to prevent cross-infection between participants and the data collection team.

**Methods:** IPC measures are being followed from local and international health governing bodies. IPC measures in a school-based dental project in Bradford will be illustrated.

**Results:** All team members have had their occupational health assessment carried out before visiting the schools as per the local guidelines. Risk assessment was performed following the University of Leeds risk assessment form and standard operating procedures covered standard infection control precautions. Also, research team members received induction training in the dental practice where the research kit is being collected, dropped off, and dental instruments being sterilised.

**Conclusion:** Following meticulous IPC measures in a school-based dental project is crucial for the safety of the data collection team and research participants.

**Not all Bugs need Drugs: Impact of COVID-19 on use of Antibiotics in Paediatric Dental Practices**

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**Background:** Antimicrobial resistance claims hundreds of thousands of lives every year across the globe and is every bit as deadly as the Covid-19, only less visible. The media hype over Covid-19 drugs, frenzied buying by consumers, accelerated leap towards tele-triage in dental practice and an overwhelmed health system has led to the unwarranted use of antibiotics in these uncertain times. The susceptibility to diseases and the metabolism of drugs is vastly different in children as compared to adults. Hence, we need to be extra vigilant while prescribing them to our young patients.

**Literature Review:** The AAPD also recognizes the increasing prevalence of antimicrobial resistance in paediatric population and has issued Best Practices in 2019 to prescribe antibiotics only in certain specific oral conditions. 'Tele-dentistry as a tool of triage' has been recommended worldwide in the current pandemic, where the patients belonging to the 'urgent' category are prescribed antibiotics and analgesics for immediate relief (Goswami et al, 2020). Advocating the antimicrobial stewardship principles has become the need of the hour (Huttner et al, 2020). As paediatric dentists, we need to be judicious with the use of antibiotics in children, as slightest ignorance from our part can affect their productive and disease-free future as adults (Agarwal et al, 2014)

**Conclusion:** More antibiotics don't necessarily mean better health. WHO has already raised a red flag on inappropriate use of antibiotics in the current pandemic. We can only hope that in our efforts to tame the dragon, we do not get eaten up by the termite.

**Assessment of Orthodontic Treatment Needs using the Dental Aesthetic Index in Russian Adolescents**

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**Background:** The Dental Aesthetic Index (DAI) is a commonly used index to evaluate the individual need for orthodontic treatment. However, the evidence on this issue from Russia is scarce. We assessed orthodontic treatment needs among adolescents in Northwest Russia using DAI to ensure international comparisons.

**Methods:** The data were obtained from the Arkhangelsk part of the national dental study. Socio-demographic data and information about 10 components of the DAI were obtained directly from a regionally representative sample (n=1091) of 15-year-olds. To obtain the DAI score, the results were summed with a regression constant. Urban-rural and gender differences in the DAI scores were studied by Mann-Whitney tests. Categorical variables were compared using chi-squared tests.

**Results:** The mean DAI score was 23.2 (95%CI: 22.8-23.6). Altogether, 66.5%, 18.7%, 9.7% and 5.0% of the participants had no or minor-, definitive-, severe- and very severe malocclusion, respectively. In total, 33.5% (95%CI: 30.7-36.3) need orthodontic treatment. No gender- differences in any of the studied outcomes were observed. Mean DAI score was greater among adolescents from rural areas (24.0 vs. 22.9, p=0.022).

**Conclusions:** The needs for orthodontic treatment for adolescents in Northwest Russia are either comparable or slightly less than in other European settings. Our findings provide internationally comparable data from a large region in Northwest Russia. However, given considerable variations in health indicators between the regions in Russia, our findings should be generalized with due caution.

**Covid-19 Pandemic: Evaluation of Stress and Anxiety Levels of Dental Professionals in Turkey**

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**Background:** COVID-19 pandemic initially emerged in Wuhan, with a reported cluster of pneumonia cases in December, 2019 and spread worldwide as a life-threatening disease. It has also triggered a wide variety of psychological problems. This study aims to investigate the attitude of the dental professionals about the Covid-19 pandemic and evaluate their anxiety about returning their routine professional practice.

**Methods:** This study is the first online self-report questionnaire nationwide during the lockdown in Turkey for the dental professionals regarding the Covid-19 pandemic. Data collection began on 28 March 2020 and ended on 2 May 2020. The modified Zung Self-Rating Anxiety Scale (SAS) was used. 259 dental professionals from different regions of Turkey contributed to the study. 60,2% of the respondents stated that they stopped working, 36,3% have only accepted emergency patients while 3,5% continued routine practice.

**Results:** None of the participants have experienced Covid-19 disease. 80,3% of the respondents reported a significant increase in their anxiety level. Female respondents showed significantly higher scores of anxiety than their male counterparts ( $p:0,028$ ) and respondents with systemic disease showed significantly higher anxiety scores than healthy professionals ( $p:0,021$ ). Also, the anxiety level of dental professionals working in public or government hospitals is significantly higher than their colleagues working in the university, private hospitals or private practice ( $p:0,010$ ;  $p:0,01$ ;  $p:0,035$ ).

**Conclusions:** Dental professionals are at high risk of contagion because of aerosol/droplet production during routine dental procedures and the awareness of the risk of aerosols. The mandatory break to their profession during the pandemic lockdown may have raised their anxiety level about returning their routine professional practice.

## **Pulpitis in Permanent Teeth and Somatic Diseases in Russian Children: An Analysis of Medical Records at a Municipal Pediatric Dental Clinic**

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**Background:** Many somatic diseases have oral symptoms. We studied associations between general health and pulpitis using medical documentation in a Russian clinical setting.

**Methods:** Altogether, 1296 patients' records were randomly selected at the municipal pediatric dental municipal clinic in Arkhangelsk, Russia. Of them, 554 fully completed records of children aged 5-17 years (Mean age 10.2 years, 51.6% - boys) were analyzed. Occurrence of somatic diseases in children was studied as well as the number of affected teeth in patients with and without somatic diseases. Pearson's Chi-square tests and Mann-Whitney tests were applied for categorical and numerical data, respectively.

**Results:** Altogether, somatic diseases were registered in 53.6% of the files. Respiratory and gastrointestinal conditions were the most common. History of pulpitis treatment was registered in 90 (16.3%) children. Totally, 131 teeth (1.5 per child) were treated. No gender differences were found in the number of affected teeth per child: 1.6 for boys and 1.3 for girls ( $p = 0.294$ ). Proportions of children with and without somatic diseases having a history of pulpitis were 17.5% and 15.2% pulpitis teeth, respectively ( $p=0.453$ ). The number of affected teeth was greater in children with somatic problems: (86 vs. 45,  $p=0.021$ ). Moreover, children with somatic diseases had more cases of chronic pulp inflammation without acute symptoms ( $p=0.034$ ) whereas in somatically healthy children the distribution of chronic and acute forms of pulpitis were similar.

**Conclusions:** The presence of somatic conditions may be associated with more severe clinical course of pulpitis with greater number of affected teeth.

## Yield of COVID-19 Screening prior to Outpatient Elective Procedures in Pediatric Dentistry

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**Background:** COVID-19 affects people of all ages. Children are typically asymptomatic but contagious. Dental procedures that generate aerosols are considered high risk for transmission. The CDC recommends screening of all asymptomatic patients prior to any medical procedure. Pre-dental procedural screening has not been universally adopted in dentistry and it's not explicitly recommended by the CDC. The goal of this study is to assess the yield of screening asymptomatic pediatric patients prior to a dental procedure.

**Methods:** A total of 629 children were evaluated for COVID-19.

**Results:** Eight (1.3%) had a positive test for COVID-19. Among these, the age range was 2-12 years, half were males and five (63%) were Hispanics. Chart review shows that these eight cases were recontacted and the parents/guardians confirmed the absence of signs/symptoms consistent with COVID-19 and the exposure to known or suspected COVID-19 individuals. All cases were safely rescheduled for future treatment.

**Conclusion:** Though the yield of testing is low, the systematic evaluation of asymptomatic pediatric dental cases results in the identification of COVID-19 carriers. This allows the adjustment of the treatment plan with the goal of minimizing the risk of infection of dental providers and the spreading of the disease.

### Need for Dental Treatment in COVID-19 Pediatric Patients

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**Background:** The COVID-19 is a pandemic of coronavirus disease caused by SARS-COV-2 affecting children and adults. The aim of this work was to assess the need for dental treatment in COVID-19 children.

**Methods:** a random sample of 120 subjects, 58 female and 62 male, aged 3-12 y.o. living in poor living conditions in Buenos Aires and diagnosed with COVID-19 were clinically examined for dental treatment needs by calibrated pediatric dentists using the CCITN (Community Caries Index of Treatment Need) at the time of the nasopharyngeal swab. Height and weight were collected as variables of medical interest and BMI (Body Mass Index) calculated and assessed according to WHO criteria. Median and range were determined for each variable and associations tested through Chi Square (p 0.05).

**Results:** Sixty patients were diagnosed with mild COVID-19, 46 with moderate and 14 with severe disease. Forty-seven patients were diagnosed with obesity and 32 with malnutrition. Median CCITN was 11 (range 6-14). The need for dental treatment was high: 23 patients showed CCITN values within the range 3- 6, 58 within 7-10 and 39 within 11-14. Significant associations (p - 0.0001) were found between severe COVID-19 and CCITN 11-14 (Chi square = 28.1) , obesity and CCITN 11-14 (Chi square = 27.1) and healthy BMI and mild COVID-19 Chi square = 59.5).

**Conclusions:** to meet the high need for dental treatment in COVID-19 children trained pediatric dentists able to collaboratively work with pediatricians will be required.



## Dental Caries and Oral Hygiene in 3-4 years old Children in an Arctic Russian Town: A Cross-Sectional Study

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**Background:** Caries in Russia has been mostly studied in children aged 6, 12 and 15 years. Evidence on caries prevalence and experience in younger children in Russia, however, is relatively limited. We studied the prevalence of caries and assessed oral hygiene among 3-4 years old children in an Arctic Russian setting.

**Methods:** In total, 479 3-4 year-olds from 12 randomly selected kindergartens in a town of Arkhangelsk (population ~350,000) participated in a cross-sectional study. Caries was assessed using the WHO methodology. Simplified Oral Hygiene Index was used to study oral hygiene. Caries experience was presented as a sum of decayed and filled teeth (df).

**Results:** The prevalence of caries was 60.1% (95%CI: 54.7-67.0) among boys and 59.6% (95%CI: 53.2-65.5) among girls. Caries experience was also similar in boys (4.10, 95%CI: 3.05-4.68) and in girls (3.57, 95%CI: 3.05-4.09). The mean value of oral hygiene index for the full sample was 1.6 (95%CI: 1.52-1.67).

**Conclusions:** More than 60% of 3-4 years old children in Arkhangelsk already have dental caries. Although our results suggest satisfactory oral hygiene, there is an urgent need for public health measures to improve the situation. Given that Arkhangelsk is a regional center in Northwest Russia, oral health is expected to be poorer in rural and remote areas of Arctic Russia.

### Knowledge of COVID-19 among Pediatric Dentists: A Cross-Sectional Study

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**Background:** The recent pandemic outbreak of COVID-19 disease has posed significant challenges for the healthcare industry. Since pediatric groups have been classified as one of the most vulnerable groups, it becomes essential to know that if pediatric dentists have enough knowledge about the COVID-19 diseases and its occupational hazards. The present study aimed to assess the knowledge and perceptions of COVID-19 among pediatric dentists based on their source of information.

**Methods:** A descriptive-analytic cross-sectional survey using a self-administered questionnaire with 15 questions [demographic-4; source of information-1 and knowledge-10] was sent via Google forms to pediatric dentists. All participants were divided into 3 groups [postgraduates (PGs), private practitioners (PP), and faculty (F)]. Chi-square test for binary data and comparison of knowledge scores among the groups has been analyzed using ANOVA with multiple comparison test Bonferroni correction with a 95% confidence interval (P0.05).

**Results:** A total of 291 pediatric dentists (PG-18%, F-47%, and PP-35%) from India have participated in the survey and the majority of them were females (65%). Overall good mean scores ( $9.2 \pm 1.07$ ) were obtained (PG- $8.9 \pm 1.4$ , F- $9.2 \pm 1$ , and PP- $9.4 \pm 0.83$ ). Majority of the participants used health authorities (45%) to know updates on COVID-19 social media (35.1%) or both (19.6%). A statistically significant difference ( $p = 0.003$ ) was found among different groups of pediatric dentists relying on the source of information.

**Conclusion:** The present study reveals that pediatric dentists exhibit excellent knowledge scores on COVID-19 symptoms and mode of transmission.

# ***Growth and Development***

**Tooth Crown Dimensional Changes in Preterm Children: A Systematic Review and Meta-Analysis**

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**Background:** Preterm birth is associated with many risk factors that have significant effects on overall health in general and on dental structures. The purpose of the study was to systematically analyze and quantitatively synthesize the available evidence regarding the effect of preterm birth on permanent tooth crown dimensions.

**Methods:** The present review was based on the specific protocol developed and piloted following the guidelines outlined in the PRISMA-P statement. Search without restriction for published and unpublished literature was conducted. Controlled studies investigating the effect of preterm birth on permanent tooth crown dimensions were reviewed. Following study retrieval and selection, relevant data were extracted, and the risk of bias was assessed using the Newcastle-Ottawa Quality Assessment scale. Exploratory data synthesis was performed using the random-effects model for meta-analysis.

**Results:** Three studies were finally identified from the initially located records. Overall, children born pre-term seemed to have smaller permanent tooth crowns in comparison to the control group children. The extremely preterm group showed statistically significant smaller mesiodistal dimensions in upper central incisors [95%CI -0.704 to -0.351, p-value=0.000], upper first molars [95%CI -0.631 to -0.312, p value=0.000], lower central incisors [95%CI -0.304 to -0.144, p value=0.000], lower lateral incisors [95%CI -0.447 to -0.236, p value=0.000] and lower first molars [95%CI -0.587 to -0.139, p value = 0.002], as well as statistically significant smaller buccolingual dimensions in upper first molars [ 95%CI -0.817 to -0.225, p value=0.001] and lower first molars [95%CI -0.822 to -0.299, p value=0.000]. The dimensional changes tended to be greater in the extremely preterm than other children born before term and were mostly observed in the early forming teeth like central incisors and first molars.

**Conclusion:** Through analysis of the limited set of data, preterm birth may affect tooth-crown dimensions in permanent teeth. Further research is needed to confirm these initial observations.

### Timing of Permanent Teeth Eruption in Turkish Children

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**Background:** The term eruption refers to the process of axial movement of a tooth from its non-functional position in the bone to functional occlusion in the oral cavity. The aim of the study to identify the mean time of permanent teeth eruption in children aged 5-13 years in, Istanbul, Turkey.

**Methods:** A total of 430 children aged 5-13 years (Female:117 Male:213) were included in this study. Cross-sectional data on permanent teeth eruption were collected by examining teeth that were recorded as either not erupted or erupted, (having at least one cusp visible in the oral cavity). Gender, age and present permanent teeth were recorded. Statistical analysis was performed using Independent T Test and Mann Whitney U test.

**Results:** Mandibular incisors erupted significantly earlier than their maxillary counterparts in both females and males ( $p < 0.05$ ). No statistically significant differences were found in the eruption times of permanent teeth on the right and left sides of the jaw ( $p < 0.05$ ). The eruption sequence in the maxilla was as follows: right first molar, left first molar, right central incisor and left central incisor. The eruption sequence in the mandibula was as follows: right first molar, left first molar, right central incisor and left central incisor. No statistically significant difference was found between genders ( $p < 0.05$ ).

**Conclusions:** Knowing the eruption times is important for planning dental treatments and forensic evaluations. Larger and more homogeneous populations are needed to more precisely determine the timing of permanent teeth.

**Association between Sella Turcica Bridging and Impacted Maxillary Canines**

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**Background:** Changes in sella turcica (ST) development may be associated with the impaction of the permanent canine teeth. The aim of this study was to evaluate if there is an association between ST bridging and the presence of impacted maxillary canines (IMC).

**Methods:** In this case-control study, two blindly and calibrated examiners, through cephalometric radiographs, measured the length, diameter and depth of the ST, and levels of calcification were established. Sixty-four patients were divided into a case group - with IMC (n = 32), and a control group - without IMC (n = 32). Comparison of ST dimensions between groups was carried out by t test, whereas the association of ST bridging with the case group was analyzed by chi-square test. The strength of the association between ST bridging and the case group was estimated by the odds ratio.

**Results:** The case group have a shorter ST length (P = 0.042), which is reduced in males (P = 0.038). ST bridging frequency is higher in case group (P = 0.03) and gender does not have an influence. The odds ratio of having ST bridging between cases was 5.92 times higher than in the control group.

**Conclusions:** It can be concluded that patients with IMC have shorter interclinoidal distance, which is reduced in males. ST bridging can be considered as a diagnostic tool to evaluate canine impaction.

## The Validity of Canine Calcification Stages Assessment Instead of Skeletal Age Assessed by Hand-Wrist Radiographs

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**Background:** Skeletal age assessment by hand-wrist radiographs were found to correlate with the growth status. However, extra-radiograph and radiation exposure are used. The purpose of the study was to evaluate whether maxillary and mandibular permanent canine radiographs were sufficient to identify the skeletal, dental, and chronological ages.

**Methods:** A total of 190 radiographs consisting of hand-wrist radiographs and orthopantomographs was evaluated. Right hand-wrist and right permanent maxillary and mandibular canine of ninety-five healthy children in the age group 8 to 15 years, comprising an equal number of males and females were included in the study. Radiographs taken for treatment were used in the study. Radiographs were not taken for research purposes. This research was approved by the ethics committee. Canine calcification stages were assessed by the Nolla method, skeletal age by the Fishman method.

**Results:** There was a high correlation between skeletal and dental ages for both boys and girls. There was a high correlation between dental and chronological ages and skeletal and chronological ages. Both permanent maxillary and mandibular canine calcification stages showed a consistent correlation with chronological ages.

**Conclusions:** It was concluded that canine calcification stages could also be used for assessing skeletal maturity and growth status. Extra- radiation exposure could be prevented by this method.

## Is it Possible that the Child's Weight May Influence the Timing of Primary Tooth Eruption? A Systematic Review

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**Background:** The timing of primary tooth emergence has recently been shown to be under the genetic control, pre-natal maternal conditions, early childhood metabolic and nutritional factors and socioeconomic variables. The aim of this study was to investigate if the weight of the child at birth and the nutritional status may influence the timing of deciduous tooth eruption.

**Methods:** A systematic search was conducted in the databases Latin American and Caribbean Health Sciences (LILACS), PubMed and Web of Science from their inception to 20th January 2020. Grey literature was searched on Google Scholar. Transversal and longitudinal studies assessing the nutritional status and tooth eruption in children were included. Two authors independently collected the information. This review was prepared following PRISMA (Preferred Reporting Items for Systematic reviews and Meta-Analyses) guidelines.

**Results:** A total of 173 studies were initially identified through the search of the databases. After removing five duplicate studies, 21 studies were considered for full-text assessment and were included in qualitative synthesis. The results of the included studies showed that premature, low-weight and malnourished children may have delayed tooth eruption. Conversely, children with high body mass index (BMI) presented early tooth eruption.

**Conclusions:** It was concluded that the child's weight status may influence the timing of deciduous tooth eruption.



### Case Report of Pre-Surgical Treatment of Cleft Lip and Palate

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**Introduction:** Although surgical techniques to repair cleft lip and palate have improved, arguably the most significant advance in surgical cleft rehabilitation has been the presurgical infant orthopedics (PSIO) management of the cleft alveolar and nasal deformity.

PSIO is used to narrow the cleft defect and improve the alignment of the maxillary segments prior to the primary reconstructive surgery so as to optimize the clinical outcome. Modern presurgical procedures began with McNeil in 1950 and since then many different types of orthopedic devices ranging from active to passive have been described in the literature.

**Case report:** A one-month old boy born with a bilateral complete cleft lip and palate was referred by an oral and maxillofacial surgeon to the department of preventive and pediatric dentistry of a private clinic. The complaint was that the infant was underweight and the tilted premaxilla. The boy was the second born of healthy young parents with an unmarkable family history. He was born after a normal pregnancy.

We opted for semi-active appliances such as that originally proposed by McNeil use modifications to an acrylic plate to mold the segments into the desired position.

**Discussion:** The aim of PSIO in BCLP is to gradually approximate the displaced alveolar segments and to center the premaxilla. Once the premaxilla is centered, attention is turned towards its retraction. The molding plate adjustment appointments were scheduled at 1 to 2-week intervals.

**Conclusion:** The benefits of PSIO are to reduce the severity of the cleft deformity prior to the primary lip, nose, and the alveolar repair.

### 3D Morphometric Evaluation of the Dental Arches of Children with Cleft Lip and Palate Submitted to Different Surgical Techniques

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**Background:** Individuals with cleft lip and palate undergo extensive and complex rehabilitative treatment starting in the first months of life through the primary plastic surgeries. This study aimed to compare dimensional alterations of children's dental arches with unilateral complete cleft lip and palate before and after different techniques of primary plastic surgeries.

**Methods:** The sample were divided into groups: G1– cheiloplasty by Millard's; and palatoplasty by Von Langenback's technique; G2– cheiloplasty by Millard's and anterior palatoplasty by Hans Pichler's; and posterior palatoplasty by Sommerlad's technique. Dental arches were evaluated before (T1), after first phase (T2), and one year after second phase (T3) of primary surgeries. To analyze method's error, Interclass Correlation Coefficient was used. ANOVA (followed by Tukey test), dependent and independent t test was used (p 0.05).

**Results:** At T1, T-T' distance was statistically greater in G2 than in G1. At T2, I-CC' was statistically in G1, while sPPlate, Clf and total area were statistically smaller in G2. At T3, T-T' distance was statistically greater in G2 than in G1. The intergroup comparison of the linear alterations of the measurements of the maxillary arches from T2 to T1 revealed statistically gPPlate for G1. The intergroup comparison of the linear alterations of the measurements of the maxillary arches from T3 to T2 and from T3 to T1 exhibited statistically greater area for G2.

**Conclusion:** Cheiloplasty and total palatoplasty resulted in larger growth restriction than cheiloplasty and 2-stage palatoplasty in the evaluation of the total area of the dental arches.

### Which Combination of Teeth Best Estimates Age using the London Atlas?

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**Background:** Dental age using development of teeth is frequently used to estimate chronological age and assess the developing dentition. One current age estimation method is the London Atlas of Tooth Development where developing teeth are assessed and an algorithm provides a single dental age. The aim was to determine which combination of upper/lower teeth best estimates age using the Atlas.

**Methods:** The sample was 946 archived panoramic radiographs of 493 male and 453 female dental patients aged 3-16 years. Crown and root stages of 8231 developing permanent upper and lower teeth on the left side were assessed. Linear regression models were used to assess predictive strength by comparing R-squared values for upper, lower and combination of teeth.

**Results:** Separately, combinations of upper teeth and lower teeth show similar R-squared values. Values for combinations of upper teeth ranged from 0.828 to 0.866, and for lower teeth 0.820 to 0.852. This reduced when combinations of both jaws were included in the model.

R-squared value using 7 upper and 7 lower teeth was 0.812. A number of teeth including premolars, showed collinearity and excluding them from the model did not change the predictive strength. All these models estimated age from 3-10 years. The R-squared value for the lower second molar alone was 0.905 and this model estimated age from 3 to 16 years.

**Conclusion:** No one specific combination of estimated age is better than another in this sample. However, including second molars and lateral incisors in the model was associated with marginally higher predictive strength.

**Digital Volumetric Monitoring of Palate Growth in Children with Cleft Lip and Palate**

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**Background:** The literature lacks studies using digital resources to measure the volume of edentulous dental arches of children with cleft lip and palate and longitudinally evaluate the impairment of the rehabilitative plastic surgeries – cheiloplasty and palatoplasty. Thus, this study aimed to evaluate longitudinally the volume of the dental arches in children with unilateral cleft lip and palate before and after the rehabilitative plastic surgeries.

**Methods:** The sample was composed of 102 digitized dental casts of children with unilateral complete cleft lip (G1) and cleft lip and palate (G2). The palate volume was evaluated at three periods: pre-operative (T1), post-operative 1 (T2), and post-operative 2 (T3). The intra- and inter-examiner reliability was analyzed by Wilcoxon test/Dahlberg's formula and Interclass Correlation Coefficient, respectively. The intragroup comparison was analyzed by Wilcoxon test and Friedman test followed by post-hoc Dunn test. Mann-Whitney test was applied for the intergroup comparison ( $p < 0.05$ ).

**Results:** G1 had a significant growth at T2 ( $p = 0.031$ ). G2 demonstrated a positive development at T2, but decreased at T3 ( $p = 0.003$ ). The intergroup analysis revealed that G2 showed a greater volume at T1 and T2 ( $p < 0.0001$  and  $p = 0.0024$ , respectively). T2-T1 exhibited no statistically significant difference ( $p = 0.262$ ).

**Conclusion:** The cheiloplasty did not interfere in dental arch growth, while after palatoplasty, the estimated dental arch volume decreased in children with unilateral cleft lip and palate.

### Cohort 3D Study of Dental Arches in Children with Bilateral Orofacial Cleft

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**Background:** Cohort studies have evaluated dental arches of children with craniofacial anomalies. The purpose of this study was to evaluate the maxillary dental arches in children with bilateral orofacial cleft before and after cheiloplasty and palatoplasty.

**Methods:** The sample consisted of digitized dental models of children with complete bilateral cleft lip (BCL) and bilateral cleft lip and palate (BCLP). The dental casts were analysed before cheiloplasty (T1), after cheiloplasty (T2), and after palatoplasty (T3). The stereophotogrammetry software evaluated the volume, area, and transversal linear measurements.

**Results:** In BCL group, at T2, intercanine (C–C'), intertuberosity distance (T–T'), area, and volume significantly increased ( $p=0.000$ ,  $p=0.000$ ,  $p=0.010$  and  $p=0.003$ , respectively). In BCLP group, the comparison T1xT3 showed that C–C' decreased, while T–T' and the area increased ( $p=0.000$ ,  $p=0.000$ ,  $p=0.000$ ). The volume increased at T2, but decreased at T3 ( $p=0.000$ ) in children with BCLP. The intergroup analysis revealed that C–C' and T–T' significantly smaller in children with BCLP ( $p=0.05$ ).

**Conclusion:** Our results indicated that the children with bilateral cleft lip and palate showed more restrictions in the post-surgical development compared to children with complete bilateral cleft lip.

### Dental Development of Children With Celiac Disease

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**Background:** Celiac disease is defined as immunological responsiveness to ingested gluten in genetically susceptible individuals. It is characterized by a lifelong intolerance to the gluten contained in wheat, rye and barley. In undiagnosed patients, it can cause serious developmental problems in childhood such as short stature and retardation of physical development. Therefore, the aim of this study was to investigate the effect of celiac disease on dental age of children.

**Methods:** This study included 64 children, aged between 6-15 with celiac disease diagnosis by Pediatric Gastroenterology Department of Ondokuz Mayıs University, Department of Pediatric Gastroenterology and undergoing dental treatment at Pediatric Dentistry Department of the same university. Control group included 64 children of the same age and gender. Panoramic radiographs taken for dental treatment were used to analyze dental age using Demirjian method. The results were statistically analyzed using T-test with a significance of p 0.05.

**Results:** It was found statistically significant that dental age of the children with celiac disease, with diagnosis age of older than 3 years, was lower than that of their chronological age, the dental age of the children who diagnosed age of younger than 3 years old and control group (p 0.05). There was no statistically significant difference in dental age in terms of gender in both groups.

**Conclusion:** It has been concluded the late diagnosis of Celiac disease causes delayed the dental age of children.

**Effect of Photobiomodulation in the VEGF Synthesis and Secretion on Human Deciduous Teeth Pulp Cells**

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**Background:** Photobiomodulation (PBM) therapy has been applied directly on the dental pulp tissue with promising results. This study aimed to compare the synthesis and secretion of VEGF by pulp fibroblasts from human primary teeth (HPF) and stem cell from human deciduous teeth (SHED) before and after photobiomodulation.

**Methods:** HPF were obtained from explant technique and characterized by immunohistochemistry, while SHED were obtained from digestion technique and characterized by flow cytometry. HPF at density of  $2 \times 10^4$  and SHED at density of  $1 \times 10^5$  were plated, let to adhere, and put on serum starvation to synchronize the cell cycles prior to photobiomodulation. Then, both cell lineages were irradiated with 660-nm laser according to the following groups: 2.5 and 3.7 J/cm<sup>2</sup>. The control group was not irradiated. ELISA Multiplex Assay assessed the VEGF synthesis and secretion at 6, 12, and 24 hours after photobiomodulation, in supernatant and lysate. Comparisons were analyzed by one-way ANOVA (P0.05).

**Results:** HPF viability statistically decreased over time for irradiated and non-irradiated cells (p 0.001). SHED had smaller viability at 12h than at 6h (p 0.001) and then at 24h (p 0.001) before and after photobiomodulation. HPF and SHED proliferation comparisons showed no differences between irradiated and non-irradiated cells (p 0.05). HPF exhibited statistically greater values of VEGF than did SHED, at all study periods.

**Conclusions:** HPF produced and secreted greater values of VEGF than did SHED before and after irradiation with both energy densities of 2.5 and 3.7 J/cm<sup>2</sup>.

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Growth and Development, Oral Medicine and Pathology, Restorative Dentistry

### **Maxillary Orthopedic Evaluation in a Pediatric Patient with Osteomyelitis Sequelae**

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**Introduction:** Osteomyelitis (OS) is an infectious condition where bacteria permeate through different osseous surfaces, cause local damage, and can affect a patient's general wellbeing. The prevalence of this condition in the maxillary bones in pediatric patients is 1%, which makes its appearance rare, and its management complex.

**Case Report:** A 3-year-old patient was assessed with the presence of an abnormal, asymptomatic growth site in the lower right maxillary region. Upon clinical observation, an increase in volume of approximately 6 cc of the posterior region of tooth 8.4, with bland consistency, and no apparent infectious sites were observed. Upon radiographic assessment, irregularly bordered radiolucent zones in the mandible were observed. The patient was referred and treated in a local hospital, where a MRSA Osteomyelitis diagnosis was confirmed. A year after the surgical treatment, an adequate evolution with an active bone formation zone was observed. In the first phase of maxillary orthopedic assessment, it is decided to tackle the present atypical swallowing, to posteriorly continue with an occlusal rehabilitation.

**Discussion:** Oral rehabilitation in a maxillary affected OS patient represents a challenge due to the vast osseous destruction in the affected site. Proper bone formation must be awaited until rehabilitation can be continued, and this should all be planned, having the patient's biopsychosocial development in mind. The present patient's age allows for early correction and prevention of further developmental consequences.

**Conclusions:** OS sequelae are a challenge due to the destructive nature of the pathology, which interrupts adequate development and therefore causes intermaxillary disharmony.



### Stages of Mineralization of the First Permanent Molars

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**Background:** First Permanent Molars (1M) are the most susceptible to dental caries. Effective prevention of dental caries in 1M depends on the duration of maturation of these teeth. The purpose was to estimate the stages of mineralization of the 1M in children.

**Methods:** The stages of 1M mineralization were examined in children aged from 3 to 10 years on 470 OPG using Demirjian method (1974).

**Results:** The crown of 1M was half formed in 8.5% cases at the age of 3. In 78.2% of the 1M the crown formation was completed to cement-enamel junction; process of root formation began (stage D). On OPG of 4 and 5-year olds stage D was recorded in 47% and 5.5% of teeth and was not detected in children of 6. Signs of the formation of root furcation (stage E) and the achievement of the same length of the roots as the height of the crown (stage F) were found in 6.9% and 6.4% of the teeth at the age of 3. Stage E registered more often at 4 and stage F - at the age of 5-6 years. Root canal walls became parallel (stage G) in 11% of the teeth in 5-year olds, reaching a maximum to 7 years - 73.6%. Frequency of stage H (complete formation of the apex) increased from 6.6% at the age of 7 to 64.6% of the teeth at 10 years.

**Conclusions:** The stage of 1M formation has a strong correlation with the age of the child (0.84-0.88).

## Growth and Development

**Correlation of Dental Calcification Stages, Skeletal Maturity Stages with Chronologic Age of Children of 7-16 years Age Group: A Cross Sectional Descriptive Study**

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**Background:** Dental and skeletal maturational status influence the diagnosis, treatment planning and prognosis of the orthodontic treatment. As human growth shows considerable variation in chronological age, physiological maturity is preferred over chronological age in the estimation of person's exact age. The purpose of this study was to correlate the dental calcification stages, skeletal maturity stages and chronologic age in children of 7-16 years age group from Central India.

**Methods:** The study was undertaken to estimate and correlate the dental, skeletal and chronologic ages in 7-16 years 204 children (101 girls and 103 boys) from Central India. The dental age was calculated by Willems modified Demirjian method using digital orthopantomograms. The skeletal age was evaluated with the help of Greulich and Pyle radiographic atlas using radiovisiographs of middle phalanx of the third finger. The stages of MP3 ossification were evaluated according to Hagg and Taranger.

**Results:** Willems method consistently underestimated the age of the children in all the age groups. Greulich and Pyle method consistently overestimated the age of the children in most of the age groups. A regression analysis was done to calculate dental and skeletal ages.

**Conclusions:** A high correlation was found between dental and skeletal ages in all children. Children in the present investigation were more advanced skeletally as compared to the dental age. Girls were more skeletally advanced while boys showed more dental advancement.

**Is Demirjian's Method for Dental Age Estimation Suitable for Romanian Children?**

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**Background:** Demirjian's method, widely used to estimate the dental age of pediatric patients, has proven its effectiveness and ease over time. However, different studies conducted in various countries, have shown that the values obtained by applying the Demirjian method may overestimate or underestimate the age of the patients. This indicates the necessity to test the method on specific populations and, if necessary, to adapt the values originally provided.

**Methods:** The sample consisted of 400 panoramic radiographs belonging to 400 Romanian children (231 girls, 169 boys), aged between 6 and 13.9 years. The radiographs were collected from three private practices in Oradea, Romania. Patients were divided into eight age categories. The Demirjian method was used to estimate the dental age. It involves the assessment of the different developmental stages of the permanent left lower dental arch teeth. The statistical analysis was performed using IBM SPSS Statistics 20 and Microsoft Office Excel/Word 2013.

**Results:** The mean chronological age of the patients was 9.937 years, while the mean dental age of the patients was 11.39 years, with a mean difference of 1.453 years. 75.8% of the patients showed an overestimation of the dental age, with only 84 patients (21%) showing a correct estimation using Demirjian's method for dental age estimation. The overestimation is visible in each age category, with mean differences ranging from 1.52 years for the 6-6.9 years age category to 1.62 years for the 13-13.9 age category.

**Conclusions:** Demirjian's method overestimated the dental age of the patients included in the study. Therefore an adaptation of the original values in regards to the Romanian population is necessary.

**Masticatory Performance in Children: A Prospective Study**

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**Background:** Chewing function plays an important role in health, due to its relation to the nutritional status and quality of life. The aim of the present study was to determine risk factors of a poorer masticatory performance, in preschoolers over a one-year period.

**Methods:** The present cohort study was conducted with 136 children selected from a cross-sectional study. The children and their mothers were contacted one year after baseline for a second evaluation. Clinical oral examinations were performed for the assessment of posterior malocclusion, number of missing teeth due to caries and the presence of dental caries. The mothers filled out a three-day dietary recall log, which was used to calculate the mean daily frequency of the ingestion of solid, liquid and pasty foods. An artificial test food (Optocal) was used for the evaluation of masticatory performance, with particle sizes determined using a set of sieves. The median size (X50) was determined from the weight of the shredded food particles in each sieve. Hierarchical Poisson regression analysis was performed.

**Results:** The increase in the number of teeth with cavitated lesions (RR=1.98; 95%CI=1.01-3.93), increase in the number of missing teeth (RR=3.29; 95%CI=1.67-6.47) and reduction in the mean daily frequency of solid food intake (RR=2.29; 95%CI=1.22-4.31) were associated with a poorer masticatory performance.

**Conclusion:** An increase in the number of teeth with cavitated lesions and missing teeth as well as a reduction in the mean daily frequency of solid food intake were risk factors for a poorer masticatory performance in preschoolers.

**Management of Regional Odontodysplasia in a Young Child: Clinical and Radiological Challenges**

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**Introduction:** Regional odontodysplasia is a rare developmental anomaly, characterised by localised deficient and abnormal formation of both enamel and dentin.

**Case Report:** A 9-year-old girl was referred by her General Dental Practitioner to the Paediatric Department, University Dental Hospital of Manchester, regarding delayed eruption of her upper right first permanent molar (UR6). The patient had previously undergone general anaesthesia for extraction of several carious teeth one year prior and on review, all other first permanent molars had erupted. Clinically, a palpable swelling was present in the region of the missing UR6. Radiographic examination revealed multiple permanent teeth on the same side to be unerupted and anomalous in their development with appearances suggestive of regional odontodysplasia. The unerupted dysplastic teeth were asymptomatic and monitored for eruptive potential. At the two-year recall, the patient reported pain with the UR6 partially erupted with associated abscess formation. A multi-disciplinary team meeting was held and the dysplastic teeth extracted under general anaesthesia followed by socket preservation and provision of an interim partial denture with future implant surgery planned. Histopathology confirmed dentine with irregular tubular architecture and calcified psammoma bodies consistent with regional odontodysplasia.

**Discussion:** A combination of the clinical and radiological investigations can show characteristic features of regional odontodysplasia nonetheless, its uncommon prevalence can make diagnosis challenging.

**Conclusion:** Multi-disciplinary management is required for long-term planning if several teeth are affected by regional odontodysplasia. Specialist input, including radiology and pathology, should be considered to ensure an accurate diagnosis.

**Hypothyroidism - Impaction or Delayed Eruption of First Permanent Molars? Case Report**

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**Introduction:** Hypothyroidism is an endocrine disorder that can involve dental changes such as malformations and delayed tooth eruption. This clinical case reports a child with hypothyroidism whose first permanent molars had not erupted at the age of eight.

**Case Report:** An 8-year-old male patient presented at paediatric dental clinic due to caries lesions. In the extraoral examination it was observed that the patient was short for his age. In the medical history, the mother reported that at 3 years of age the child was diagnosed with hypothyroidism and has since been treated with Levothyroxine. In the intraoral examination, the absence of the first permanent molars in the mouth was observed. However, on the panoramic radiograph their image was present, without the presence of bone above the crowns.

**Discussion:** In most cases, the treatment is to wait for the spontaneous eruption of the teeth, however, considering that the molars already had more than two thirds of root formation and that after the closing of the apices, the eruptive potential is lost, requiring traction, it was decided to perform gingivectomy. In the recall examinations, the eruption of teeth was observed.

**Conclusion:** In view of the present clinical case, the importance of a thorough clinical examination combined with the professional's knowledge is noted, as there are several systemic changes that can impede the dental eruption. In addition, it is necessary to know the broad eruptive process to be able to differentiate between delay and impacted teeth, in order to make a less invasive treatment.

**The Diagnostic and Treatment Modalities for Pediatric Sleep Apnea: A Systematic Review**

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**Background:** Obstructive Sleep Apnea (OSA) is a sleep-related breathing disorder characterized by episodes of upper airway collapse during sleep. It exists as an overlapping condition which occurs along the continuum- from cradle to grave. In pediatric population, the diagnostic and treatment approaches are different as airway is small with lesser respiratory reserve. Both genetic and environmental influences play a part in its etiopathogenesis. Adeno-tonsillar hypertrophy, obesity, craniofacial anomalies and abnormal neuromotor tone are the main conditions in pediatric population that predispose anyone to childhood sleep apnea. Screening of OSA should be integrated into healthcare visits as it has widespread effects on neurological, cardiovascular, endocrinal and cognitive performance.

**Methods:** Literature search was performed in all the standard databases – PubMed, Scopus, Medline, Cochrane and Google Scholar without any restriction of language and time. Cohort, case control involving varied evaluation of different procedures for diagnosis and treatment from the conventional to recent advancements have been included in this review.

**Results:** A total of 30 studies were included for the final qualitative synthesis. Data showed that the current tools for diagnosis are onerous and labor-intensive; hence measures are required to standardize and link both the physiological and biological systems to aid in early diagnosis.

**Conclusion:** Age-specific diagnostic measures are required to prevent or reduce large array of morbidities in adulthood. The treatment modalities range from conservative approach to orthodontics and surgery with strict clinical follow-up.

### **Comparative Evaluation of Skeletal Age Marker and Dental Age Estimation Method with that of Chronological Age of Children**

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**Background:** Chronological age provides incomplete idea about the maturational status of an individual. Hence, maturity indicators such as dental age and skeletal age play an important role. The purpose of this study was to check accuracy and comparison of dental age and skeletal age using the Demirjian's method and Cervical vertebrae maturation indicator (CVMI) with their chronological age of 10 to 16 year old subjects residing in Wardha district.

**Methods:** The study included 150 subjects among the range of 10 to 16 years of age residing in Wardha district. To calculate the dental age estimation, Orthopantomogram was used for Demirjian's method, whereas for Skeletal age estimation, Lateral cephalogram was used for cervical vertebrae maturation index (CVMI).

**Results:** The chronological age indicated by the above methods were found to be statistically significant ( $p < 0.05$ ). On comparison of age estimated by Demirjian's method and the skeletal CVMI method of both males and females a statistically significant correlation value of 0.524 was observed.

**Conclusion:** The Cervical vertebrae maturity index in comparison to the dental age methods, was able to show more correlation with the Chronological Age. This index may be suggested in case of children showing discrepancy in their developmental state and chronological age.



**Arrested Root Development following Proton Beam Therapy: A Case Report**

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**Introduction:** Proton Beam Therapy (PBT) can be used to treat cancers in those patients with tumours near critical structures. PBT uses high energy protons to precisely target tumours thereby reducing damage to surrounding healthy tissues compared with conventional radiotherapy.

**Case Report:** An asymptomatic 8-year-old girl was referred by her oncologist for dental assessment. Medically she had been diagnosed with rhabdomyosarcoma of the left nasal cavity when aged 3. This was managed with surgery and chemotherapy (9 courses of IVA-Ifosfamide 54g/m<sup>2</sup> total, actinomycin D, vincristine). She then received PBT at an international centre (Oklahoma, USA) and had 4 months of maintenance chemotherapy (cyclophosphamide, vinorelbine). On examination she had a Class III skeletal base with maxillary retrognathia and reverse incisal overjet. An OPG radiograph showed severe arrested root development of all her permanent maxillary teeth. Her lower permanent dentition appeared to be developing normally. A small volume cone-beam CT around the unerupted UL3 showed early follicular expansion with possibility of early dentigerous cyst development.

**Discussion:** This patient will require long-term multi-disciplinary care with input from orthodontic, restorative, oral surgery and oncology teams. Her treatment will be highly complex given her medical history, arrested dental development and limited restorative options.

**Conclusion:** This report highlights arrested root development as a potential complication following PBT, which is already a well-known sequela of conventional radiotherapy. Members of both dental and oncology teams should be aware of this to ensure patients and their families are well-informed and receive regular dental follow-up and specialist MDT care if required.

### A Congenital Epignathus in a 3-day old Neonate

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**Introduction:** Congenital epignathus teratomas are rare benign neoplasms often composed of tissues from the three germ layers. They can present in the nasopharynx, oropharynx or more rarely in the oral cavity alone. They are benign but can be associated with breastfeeding issues, a failure to thrive and airway obstruction. A review of the literature suggests early resection as the preferential management due to functional and aesthetic reasons. This report presents a case of epignathus affecting a 3-day old girl.

**Case Report:** This patient presented to an Accident and Emergency department with jaundice and 12.5% weight loss because of poor feeding due to an oral mass. Urgent referral to OMFS was made who noted a 2 x 3 cm pedunculated firm painless mass on the left mandibular alveolus causing impaired latching. Antenatal scans and maternal medical history were clear. No immediate airway obstruction was evident. Nasogastric feeding, triple phototherapy and support from the breast-feeding team helped resolve feeding issues, weight was gained and mother and child sent safely home. Out-patient follow up was undertaken to check for changes in the lesion and plan future resection. Clinical photographs aid to illustrate this case.

**Discussion:** This case emphasises the importance of liaison with the breast-feeding support team to help reduce the need for emergency general anaesthetic and surgery in the neonate.

**Conclusion:** Breast feeding support teams may successfully aid the management of neonatal patients presenting with sizeable oral lesions.

## Growth and Development

**Assess the Emergence of First Permanent Teeth among School Going Bangalore Children**

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**Background:** Permanent teeth are biological markers of maturity and their eruption is an important milestone in a child's development. The clinical maturation stage of permanent dentition is determined by the number of permanent teeth that have erupted in a child's mouth by a specific age. The purpose of this study to assess the emergence time of first permanent teeth among school going Indian children.

**Method:** A total of 502 school going children aged 5-7 years were randomly selected from in and around Bangalore city, India. After acquiring general information, they were subjected to clinical examination wherein the eruption status of first permanent tooth was assessed and entered in a specially designed format. The data was analyzed by SPSS software and descriptive statistics was done.

**Results:** The first tooth to emerge in the oral cavity was lower left central incisor at the age of 6.09 years in boys followed by lower left first molar, upper left first molar at the age of 6.10 years. In girls, the upper left first molar and upper right first molar, emerged at the age of 6.10 years followed by lower right first molar at 6.11 years.

**Conclusions:** In general, there is a delay in emergence in Indian children when compared to previous studies done in other cities. An accurate knowledge of contemporary dental emergence pattern is important for monitoring normal occlusal development and effectively planning the dental treatment in children and adolescence.

## Growth and Development

**A Co-Relation between Body Mass Index and Height, to Dental, Skeletal and Chronological ages of 7-15 year-old Children**

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**Background:** Growth in a child, is a cumulative score of numerous biological factors including dental, skeletal, chronological age and morphological traits like height and weight. As paediatric dentists, planning age-sensitive and growth modulating treatment approaches are unavoidable. Currently Chronological age remains the basis for this, which is unreliable and inaccurate. A child's true Dental and Skeletal ages can only be determined by appropriate markers, which can be misconstrued in children with deranged body mass index (BMI) or abnormal height-for-age. Hence, present study was undertaken to co-relate average BMI and height of a child as per his/her dental and skeletal development and associate it with their chronological age.

**Methods:** A total of 30 children of ages of 7-15 years were selected and Chronological ages were calculated by date of birth. Child's height and weight were recorded and then verified (Growth Percentile Chart CDC 2000) to check for appropriate height-for-age. BMI was computed as per 2011 CDC assessment. Dental and Skeletal Ages were estimated using Demirjian's method (1973) and Cervical Maturation Method (Bacetti, 2005) respectively.

**Results:** The present study predicts dental development to be **1.71 years** delayed compared to the chronological age whereas skeletal maturity of the child was found to be accurate till about **+ - 4 months**.

**Conclusions:** A significant correlation was found between Chronological ,dental ,skeletal ages .The dental age was found to be strongly related to the **BMI** of the child. It was found that **skeletal age** was more reliable than dental age while estimating a child's growth status.

## Growth and Development

**Parameters of Facial Esthetics for Designing Smile in Primary Dentition: An Observational Study**

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**Background:** With the increasing popularity of esthetics in pediatric dentistry, it has become important to determine what constitutes a pleasing and socially acceptable smile in a child. This short study was conducted to determine the dental and facial parameters of esthetics in children and whether they were comparable to those of adults.

**Methods:** 25 children (ages ranging from 5-6 years) with intact primary dentition that was caries free, pleasing smile and proportionally acceptable facial components were taken. Their facial and dental parameters were recorded, standard deviations were calculated and compared to those of the adults'

**Results:** The mean facial and dental parameters of esthetics namely Intercanthal, Interdacryon, Interaleae, Interchillion, Intertemporal, Nose width, Eye width, intereye point to soft menton, intereye point to ala point and ala point to soft menton, were seen. The relation between dental and facial components was established and found comparable to adults in many parameters.

**Conclusions:** The different parameters of facial esthetics established in the adults can be used for creating an ideal smile for children.

## **Management of Midface Hypoplasia in a Cleft Patient using Alt Ramec Protocol with Face Mask Therapy: A Case Report**

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**Introduction:** Midfacial retrusion is the most common problem associated with cleft patients. The conventional use of rapid maxillary expansion combined with facemask therapy in growing cleft patients brings about average protraction 1.5–3 mm in 10 to 12 months. Recently, an innovative technique involving alternate rapid maxillary expansions and constrictions (Alt-RAMEC) was developed by Liou and Tsai in 2005 for extensively disarticulating circum-maxillary sutures without overexpansion. Therefore, this case report highlights the collaborated use of a facemask with Alt RAMEC to treat midface deficiency in cleft patients.

**Case report:** An 11-year-old female patient was presented with unilateral cleft lip and palate, concave facial profile, anterior crossbite (overjet: -5mm) and bilateral posterior crossbite. Cephalometric analysis showed skeletal Class III malocclusion with maxillary hypoplasia. The 5-week ALT RAMEC protocol was chosen using a bonded Hyrax, commencing with expansion in the first week, alternating to constriction in the second week, and ending with expansion in the fifth week. The daily expansion or constriction of the Alt-RAMEC was 1 mm. Following this, patient was asked to wear Delaire type face mask daily for 14 h engaging with 5/16" elastics (14 oz). The correction of the reverse over jet was achieved in 6 months.

**Discussion:** ALT RAMEC, when applied closer to the peak of growth, showed more stable results than RME in cleft patients. It has been reported that the amount of maxillary protraction was 5–6 mm in 5 months under Alt-RAMEC and was significantly more than rapid maxillary expansion.

**Conclusion:** This approach improved facial profile, corrected crossbite and can be an effective treatment option for management of young cleft patients. However, the patient has to wear the appliance conscientiously for the desired overcorrection of maxillary protraction to be successful.

### **The Premature Birth Impact on the Skeletal Base Discrepancies using the Adolescent's Plasters Cast Models: A Descriptive Study**

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**Background:** In Brazil, the population based showed 11.7% preterm birth prevalence in 2013. Premature birth brings repercussions on the early childhood (lower values in birth weight, height and head circumference when compared with the full term child standard values). It affects the morphology and growth of the craniofacial complex. The aim of this study is to evaluate the preterm birth impact on skeletal base's discrepancies development (maxillary and mandible) of 46 adolescents (10 to 17 years at present), who had premature births with or without a perinatal incubator care period (1-91 days).

**Methods:** The sample was divided in two groups according to the calculated average value of the head circumferences (HC) at birth. This was based on the head circumference specific for gestational age and gender by the Olsen curve. The plasters models of all adolescents were measured by the Korkhaus analyses.

**Results:** The median value was 28 cm. Thus, 8 (34.8%) adolescents (AD) presented with head circumferences at birth lower or equal to 28 cm and were classified in the group  $HC \leq 28$  cm; 2 (8.7%) other AD were classified in the group  $HC > 28$  cm ( $p = 0.035$ ). A higher percentage of anterior atresia was observed between AD classified with  $HC \leq 28$  cm (26.1%), when compared to those who had a HC of  $> 28$  cm (IC 95%: 3.5%; 48.9%). There is a difference between the patients who were or were not submitted to an incubator period in relation to the evidence of  $HC \leq 28$  cm and anterior atresia (28.1% x 7.1%), ( $p = 0.025$ ).

**Conclusion:** There was an association between  $HC \leq 28$  cm, the perinatal incubator period and anterior atresia measured on the plaster casts of premature born AD.

**Loss of Space after Premature Loss of Primary Molars**

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**Background:** The aim of this pilot prospective study was to evaluate changes after early loss of deciduous molars in the lower arch.

**Methods:** The inclusion criteria were children between 6 and 9 years old with indication of extraction of the primary molar in one hemiarch. The participants were randomly allocated in two experimental groups: G1 (early loss of first deciduous molar) and G2 (early loss of second deciduous molar). To assess the space, the arches were molded at two different times: T1 - before extraction of the primary tooth; T2 - 7 to 14 days after extraction of the primary tooth. Data were collected from plaster models by one blinded and calibrated evaluator using a digital caliper. The measures evaluated were linear distance of extraction space, intercanine width and arch width. Statistical analysis was performed using SPSS 20.0. The Shapiro-Wilk test were used ( $p < 0.05$ ) to assess the normality.

**Results:** In G1 there were no statistically significant difference between T1 and T2. In G2 there were a significant difference between T1 and T2 in the linear distance.

**Conclusions:** In view of the early loss of the deciduous second molar the space maintainer must be installed immediately after extraction.



### Estrogen Deficiency Influences the Gene Expression of Growth Factors in the Odontogenic Region and the Tooth Eruption Rate

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**Background:** Several studies have highlighted how endocrine involvement can significantly contribute to tooth eruption disorders. The objective of this study was to evaluate the influence of estrogen deficiency on the gene expression of growth factors BMP4, SMAD6, GH, IGF-1, RUNX2, and TGFβ1 on the odontogenic region and on the rate of tooth eruption, in a murine model.

**Methods:** Forty Wistar Hannover rats were divided into two groups according to the intervention received: OVX Group - ovariectomy surgery and SHAM Group - fictitious surgery. The rate of tooth eruption (mm/day) of the lower incisors, under the condition of hypofunction and hyperfunction, was evaluated using images captured by a camera coupled to an optical stereo microscope, from the 35 days-old of uterine life, every 48/72 hours, for 21 days. After euthanasia, the odontogenic region was analyzed for BMP4, SMAD6, GH, IGF-1, RUNX2, and TGFβ1 expression by real-time PCR. The Student's t-test was used to compare the mean eruption rate and gene expression, with a 5% significance level.

**Results:** Only the SMAD6 expression showed a statistical significance difference between the groups, which was increased in the OVX group ( $p=0.04$ ). The rate of tooth eruption in the condition of hyperfunction showed a delay in the OVX group ( $p=0.03$ ).

**Conclusion:** Estrogen deficiency increases the expression of SMAD6 in the odontogenic region and produces a delay in the tooth eruption rate in teeth with hyperfunction.

## Growth and Development

**Establishing Frontal Sinus Index as a Skeletal Maturation Indicator in Children Based on the Assessment of Cervical Vertebrae Skeletal Maturation Index and Permanent Canine Calcification**

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**Background:** Research has implied that chronological age is not a dependable indicator to evaluate the maturity of a child. As such, the level of maturity in a child is best estimated relative to specific stages of physiologic maturity (Demirjian et al).

**Methods:** A random selection of 257 patients from the age group of 7-15 years was done. Informed consent was obtained. The inclusion criterion was no congenital anomaly in skeletal and dental conditions, no history of trauma, no extractions for orthodontic treatments. A single examiner performed radiographic assessments on lateral cephalograms for the CVMI (Hassel and Farman method) and the periphery of the frontal sinus was traced using Erturk's assessment. On the same patient's OPG Canine Dental maturity using the Demirjian Index was performed.

**Results:** The length (height) and breadth (width) dimension of the frontal sinus frontal sinus index (FSI) was deduced. D.I and the CVMI were then compared to the FSI. There is a comparatively low correlation between CVMI And FSI. However, there exists a significant negative ( $p < 0.05$ ) correlation between maxillary and mandibular canine and FSI. This indicates that as the canine value increases (as maturation progresses) the FSI will decrease. The decrease in the ratio also signifies the increase in the width of the frontal sinus.

**Conclusions:** This is the first study, which correlates the frontal sinus index with canine and cervical maturation. There is an inverse relation between FSI and Canine maturation. A randomized blind study with a larger sample size could provide better insight

### Estrogen Receptors and EMG-activity of Masticatory Muscles in Healthy Children

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**Background:** Studies suggest that estrogen receptors (ERs) play a significant role in muscle function. The purpose of this study was to analyze the association of single nucleotide polymorphisms in ESR1 (estrogen-receptor-alpha) and ESR2 (estrogen-receptor-beta) with electromyographic (EMG) activity of the masticatory muscles in healthy children.

**Methods:** A total of 109 healthy children ( $8.7 \pm 2.0$  years), were included. Parents answered a questionnaire related to the health condition of their children. DNA was obtained from saliva samples. The EMG signal of the masticatory muscles was collected during four different clinical situations. Chi-square and ANOVA tests were performed ( $p < .05$ ).

**Results:** There was an association between EMG-activity of masticatory muscles with polymorphism (ERS1) during rest [left-masseter rs1884051 ( $p = .04$ ), rs2234693 ( $p = .04$ ), rs9340799 ( $p = .02$ ); right-temporal rs9340799 ( $p = .04$ ), left-temporal rs2234693 ( $p = .03$ )]; at the time of the left-laterality [right-temporal rs9340799 ( $p = .02$ )]; during maximum-voluntary-contraction-P [left-masseter rs1884051 ( $p = .04$ ), rs1884051 ( $p = .01$ )] and in the maximum-voluntary-contraction [left-masseter rs9340799 ( $p = .01$ )]. Homozygote variations were associated with decreased EMG-activity in the mandibular rest position and with increased activity during other mandibular tasks. Association between EMG-activity and polymorphism (ERS2) was observed during left-laterality [right-temporal rs4986938 ( $p = .007$ )] and protrusion [right-masseter rs4986938 ( $p = .01$ )]. TT genotype in rs4986938 (ESR2-gene) was associated with increased EMG-activity for right-masseter and temporal muscles in the right-laterality and protrusion.

**Conclusion:** Polymorphisms in ESR1 and ESR2 are associated with EMG-activity of the masseter and temporalis muscles in healthy children.

### **A Complex Presentation of Cleidocranial Dysplasia and Discussion of Management Strategies**

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**Introduction:** Cleidocranial dysplasia (CCD) is a rare congenital disorder primarily affecting cartilage ossification into bone. Affected individuals classically present with partially developed or absent clavicles, broad short skulls and wide-set eyes. Dental manifestations include delayed exfoliation of primary dentition, delayed eruption of permanent dentition and presence of multiple supernumerary teeth. The management of these patients is particularly challenging especially orthodontically. The authors present a complex case of cleidocranial dysplasia and discuss strategies available to appropriately manage patients.

**Case Report:** A 13-year-old male presented with cleidocranial dysplasia. He also had learning difficulties. Intra-oral examination revealed a full complement of deciduous teeth except the lower right primary tooth which was completely submerged. On Cone Beam Computed Tomography examination identification of teeth and distinguishing between permanent successors, supernumerary, malformed and ectopic teeth was extremely difficult. Stacking of molars was present bilaterally.

**Discussion:** Accepted approaches in the literature include the Toronto-Melbourne approach, the Belfast-Hamburg approach, and the Jerusalem approach. However none of these interventions could provide a satisfactory result alone for this case report.

**Conclusion:** In the case of a 13-year-old boy with learning difficulties and multiple ectopic teeth, supernumeraries and molar stacking treatment planning is difficult. The case demonstrates the clinical significance of making the best use of a multidisciplinary approach in order to manage the occlusion of CCD patients.

### Growth with Somatic

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**Background:** A tooth is a highly specialized organ. In the last decade, tissue engineering has undergone enormous expansion in dentistry. The stem cells has shown great deal of effects in regeneration. With recent advances in technology, it seems likely that building a fully functional human tooth will be a reality in the near future, which plays an important role in human dentition.

**Literature Review:** Isakaj et al in 2001, the continuous regeneration of periodontal ligament is to involve mesenchymal progenitors that can differentiate either cementoblasts or osteoblasts

Bottero et al in 2000 stated that, dental pulp stem cell contains precursors which when subjected to appropriate signals are capable of forming odontoblasts.

Grove et al in 2004 stated that, bone marrow contains two cell population which are hematopoietic and mesenchymal which can give rise to ameloblast like cells.

**Conclusion:** The development of a tooth is under the control of cellular and molecular events which take place at specific times and zones using dental pulp stem cells, stem cell from human exfoliated deciduous teeth, periodontal ligament stem cell, stem cells of the apical papilla and dental follicle stem cell. Several types of dental stem cells have been isolated from post-natal tissue in humans and other animals. Hence somatic cells provide a break-through in the existing phase of dentistry.

# *Infant Oral Health*

**Diagnosis of Infant Bruxism: A Review of the Literature to Assist the Dentistry**

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**Background:** Bruxism is defined as a parafunctional habit characterized by repeated clenching of the teeth in an unconscious way, which may be associated with occlusal interference or psychological factors, occurring during sleep or waking state. The aim of the present study was to analyze the pertinent literature about diagnosis of children bruxism, in order to assist the dental professional in the recognition this condition.

**Methods:** Through databases PubMed, Scielo and Lilacs, searching the specific terms the literature, was reviewed and article selection by two independent examiners. The criteria established for research were children from 0 to 12 years of age, independently of sex, year or geographical context.

**Results:** Initially, 1409 articles were identified. After the exclusion of duplicates, evaluation of titles, abstracts and full text, 42 articles were totaled. A table was drawn to extract data and through this the studies were mapped according to the following categories: title, author (year of publication), type of study, age of participants/sample size and method of diagnosis.

**Conclusion:** The association between clinical examination and report of parents, with a specific criteria, suggests a good conduct for the dentist. Although polysomnography is considered the gold standard method, it depends on financial conditions and management, mainly in the case of children. Therefore, the association between clinical examination and report of those responsible, with specific criteria, proved to be a good method for the dentist.

### Attitudes, Practices and Knowledge of Macedonian's Pediatricians and Primary Health Care Physicians Regarding Perinatal and Infant Oral Health

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**Background:** A shared approach, coordination and care for oral health as an integral part of general health should be an imperative for every primary health care worker. The aim of this study is to evaluate the knowledge, attitudes and practices, regarding infant's oral health, of pediatricians and physicians who are part of the primary health care in Republic of North Macedonia.

**Methods:** The survey was conducted in January 2020 with the distribution of an anonymous survey questionnaire electronically in the form of a Google Document to 130 pediatricians and primary care physicians. The questions examined early childhood caries knowledge, attitudes about their role in preventing childhood oral health, and practices for promoting good oral health.

**Results:** 85.7 percent of doctors believed they need additional oral health education, 93.9 percent of respondents believed that they must educate parents / guardians about the importance of the preventive measures to maintain children's oral health, and that they must advise parents in case of suspected caries to visit a dentist / pedodontist. Only 46.9% of respondents knew that cariogenic bacteria can be transmitted vertically from mother to newborn. A small percentage (26.5%) of respondents knew that white spots on baby teeth are early signs of caries.

**Conclusions:** A Guide to Perinatal and Infant's Oral Health for all health professionals who are in contact with a child in the first years of life would help to properly guide and educate parents in preserving infants oral health.



**Molar Incisor Hypomineralization (MIH) and its Prevalence the Impact of Oral Health Related Quality of Life in Schoolchildren in the City of Macapá, Amapá, Brazil**

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**Background:** To date, few studies have evaluated the impact of molar incisor hypomineralization (MIH) on the oral health related quality of life (OHRQoL) in schoolchildren. The main target of this study was to first assess the MIH prevalence in Brazilian schoolchildren and second, to investigate the impact of MIH on the OHRQoL.

**Methods:** A cross-sectional study was carried out in 1.155 children aged 8 to 10 years old, coming from public schools in Macapá, Brazil. Calibrated dental examiners performed the children's oral examination for MIH using EAPD criteria. The children answered the Child Perceptions Questionnaire (CPQ8-10). Poisson regression was used to determine associations between the variables.

**Results:** The prevalence of MIH in first permanent molars was 30.8%. Most children (93.7%) have presented some impact, with 89.6%, 68.4%, 66.8% and 62.8% have shown impact on the domains of oral symptoms, functional limitation, emotional well-being and social well-being, respectively. Younger schoolchildren have presented a greater impact on the functional limitations domain (PR: 1.15; 95% CI: 1.04-1.27). However, children with MIH presented a greater impact in the oral symptoms domains (PR: 1.06; 95% CI: 1.02-1.10), functional limitations (PR: 1.26; 95% CI: 1.17-1.35), Emotional well-being (PR: 1.24; 95% CI: 1.15-1.34), Social well-being (PR: 1.26; 95% CI: 1.16-1.38), as well as in the general quality of life (PR: 1.05; 95% CI: 1.02-1.08).

**Conclusion:** It was concluded that the MIH prevalence in Brazilian schoolchildren was high. MIH showed a significant impact on OHRQoL according to children's perceptions.

**Action of Topical Fluoride on Saliva Protein Activity of Children with Treated Carious Lesions**

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**Background:** It is known the use of topic fluoride alters the enamel properties, as phisical, mechanical and chemical, due to its incorporation into tooth structure. Thus, the present study aimed to assess the influence of professional fluoride application on the protein profile of saliva and EAP of children aged 7 to 10 years, with treated caries lesions.

**Methods:** A sample consisted of 14 children with a previous history of treated dental caries. Saliva was collected from all children, divided into 2 groups. No group control (GC) - saliva collection 2 hours after prophylaxis; Tested group (GT) - saliva collection 2 hours after prophylaxis with topical fluoride application. For this, the disposable infant molds were filled with standard fluoride patterns and kept in position for 4 minutes. After collection, the material was stored at -80 ° C for further analysis. The MS / MS data were compared with the human protein database. With the aid of Venn diagram, the data were analyzed.

**Results:** Of the unique proteins of both groups, for calcium binder (5.45 and 10%), glucose / insulin regulation (5.45 and 1.67%), linked to bicarbonate, magnesium and phosphate (0.90 and 3.34%), enzymatic activity (16.36 and 25%), indicating GC and GT, respectively. In addition, annexin was found in GT, which has an effect against demineralization.

**Conclusion:** Thus, it is suggested that the GT has a tendency to precipitate calcium, magnesium and phosphate, fewer binding to sugars. Thus, GT may have an effect in favor of remineralization and against demineralization.

### How Oral Health Literacy and the Behavior of Parents during the Meals Relate to the Experience of Dental Caries in Children: Cross-Sectional Study

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**Background:** The experience of dental caries in children has been associated with family behaviors. This study verified the association between the level of oral health literacy (OHL) of parents or caregivers, their behavior during the children meals, and the prevalence of dental caries in children (PDC).

**Methods:** In this cross-sectional study, 630 children were examined to determine the PDC and their parents were interviewed to obtain information related to socio-demographic conditions (SDC), OHL using the Brazilian version's of the Rapid Estimate of Adult Literacy in Dentistry – 30 (BREALD-30) and the Parent Mealtime Action Scale (PMAS). The analysis fitted zero-inflated negative binomial regression models to assess unadjusted and adjusted associations between the study outcome and covariates as the BREALD and PMAS.

**Results:** In the unadjusted analysis of PDC, SDC and OHL were associated with the outcome ( $p < 0.05$ ) and the caries severity (CS) was only associated with PMAS. In the adjusted model, PDC was more among 3- (PR=1.85, 95%CI=1.19-2.87) and 4-year-old (PR=2.43, 95%CI=1.60-3.71), those with at least one sibling (PR= 1.66, 95%CI=1.18-2.33). However, children whose parents/caregivers gain  $\geq 2$  Brazilian Minimum Wage were less PDC (PR= 0.66, 95%CI=0.48-0.91). The use of rewards (PMAS) associated positively with the CS (RR= 0.90, 95%CI=0.84-0.97) and parents/caregivers with ideal levels of OHL (PR=0.66;  $p=0.045$ ) associated with a lower PDC.

**Conclusions:** There is association between parental OHL and dental caries in preschool children in the unadjusted model. The age of children, the number of siblings, the family income and the use of reward were associated with dental caries.

### ECC Prevalence and Background Factors in Belarus

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**Background:** ECC is a chronic disease affecting the deciduous dentition in children aged 71 months or less.

**Methods:** 393 children (1-6 years) were examined according to a new Protocol for ECC Diagnosis and Risk Assessment (2018) by four calibrated dentists ( $\kappa=0.95$ ) in Minsk and Brest regions. Children were divided in 5 groups: 12-23 months (n=55), 24-35 months (n=77), 36-47 months (n=93), 48-59 months (n=77), 60-71 months (n=91). Regional Ethics Committee approval and parental informed consents were obtained. Parents answered the questionnaire. The results were analyzed statistically.

**Results:** 59.4% of parents brush their children's teeth themselves: 43.4% do it once a day, 37.6% - do it twice a day and more. 22.9% of parents use fluoride toothpaste. 79.6% of kids were breastfed with a mean age of 9.2 (8.0) months, 20.4% were bottle-fed for 9.8 (8.7) months. The mean age of night feeding was 13.5 (7.8) months. 46.8% of kids have 3 to 4 meals per day and 62.0% eat sweets every day.

The prevalence of ECC was 62.9% (n=247). The mean ECC0-3mft was 4.0 (4.33) and increased from 1.2 (1.93) in group 12-23 to 7.10 (5.0) in group 48-59. The mean ECC0-3mfs was 6.08 (7.93), increased from 2.07 (4.33) to 12.30 (10.75) accordingly. The mean ECC1 (initial lesions) was 1.40 (2.04) and the highest level was in group 60-71 2.18 (2.09).

**Conclusions:** It was revealed that there is a direct correlation between ECC1 intensity and usage of fluoride toothpaste and intake of sugar containing food. Parents should be informed regarding tooth brushing behavior and regime of sugar intake as early as possible.

**Survival Rate of Pulpectomy in Primary Molars using Feapex® Paste: A Clinical Study in Infants**

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Corrêa

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**Background:** The aim of this clinical study was to evaluate the survival rate of a new pulpectomy protocol using 2% chlorhexidine digluconate and Feapex® paste for endodontic treatment in primary teeth.

**Methods:** A total of 105 pulpectomies were performed in 48 infants (1-3 years old) with high caries experience and irreversible pulpitis or pulp necrosis. All treatments were performed by dental surgeons with no specialization in pediatric dentistry. The clinical and radiographic outcomes were collected by one trained independent evaluator. Success was determined by the absence of pain, pathological mobility, pathologic bone rarefaction, pathological root resorption and soft tissue pathology around the affected tooth. Survival of the endodontic treatment was evaluated by estimating survival rates through Kaplan-Meier curves. Cox regression analysis with shared fragility was performed to evaluate the association between the independent variables endodontic treatment failure ( $\alpha=5\%$ ).

**Results:** After 24 months, the treatment survival was 86% (SE=0.03). Root resorption at baseline was associated with a higher risk of failure (HR=2.81; CI=1.12-7.08; p=0.027). The survival of teeth receiving endodontic treatment due to dental trauma was 100%, while teeth with dental caries had a lower survival rate (85%; p=0.001). Other variables including gender, age of the child, tooth position (incisor/molar), restoration type, obturation quality, and caries experience were not associated with treatment failure (p0.05).

**Conclusions:** The new protocol using 2% chlorhexidine digluconate and Feapex® produced a relatively high survival rate and may be considered as a suitable protocol for pulpectomy in primary teeth.

Trial Registration: REBEC (RBR-282s2f).

**Tethered Oral Tissues in Infants: View of Related Professional in Dentistry**

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**Background:** Aim:- A cross sectional study about the repercussions of tethered oral tissues in infants influencing growth and development was conducted to assess current opinion/ perspective of specialists like oral and maxillofacial surgeons and pedodontists about tethered oral tissues in infants influencing growth and development.

**Methods:** A self administered questionnaire was sent through emails to pedodontists and oral surgeons of which 192 dentists ( 46.35% were oral surgeons and 53.65% were pedodontists) have responded. The responses obtained were tabulated and subjected to statistical analysis using Chi-square test.

**Results:** Most commonly reported complications include speech defects (77.6%), breast feeding dysfunction (71.8%), midline spacing between teeth (71.4%), atypical swallowing(67.7%) followed by sleep issues (31.8%) and dento skeletal alterations (43.2%). Least possibly reported complications are postural alterations (10.4%); caries susceptibility (13.5%); unexpected and unexplained asphyxia (15.6%); tearing of gingival tissues(19.3%).

**Conclusions:** Both pedodontists and oral surgeons believe that tethered oral tissue cause breast feeding dysfunction, speech impediments, midline diastema and permanence of atypical swallowing but limited awareness exists about their effects like sleep and breathing disorders, caries initiation, gingival recession, malocclusions and postural alterations. Hence there exists a need for additional understanding of the tethered oral attachments in infancy.

## Is There an Association between Sleep Bruxism and Signs and Symptoms of Temporomandibular Disorders? A Cross-sectional Study

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**Background:** Awake bruxism is often indicated as a risk factor for the occurrence of temporomandibular disorders (TMD). However, there is still a lack in the literature when it comes to the evaluation of the relationship between sleep bruxism and TMD in children. The aim of the present study was to compare the signs and symptoms of TMD between children with sleep bruxism and control group.

**Methods:** A total of 42 participants (21=sleep bruxism; 21=control group), aged 8 to 15 years were included in this study. Both groups were evaluated according to the Diagnostic criteria of Temporomandibular disorders (DC/TMD). Mann-Whitney U test was used to compare the differences between mouth opening (mm) and child's pain after joint palpation (using VAS - Visual Analogue Scale). Chi-square test was performed to compare the presence/absence of overbite, joint noise, headache, parafunctional habits and uncorrected deviation to the ipsilateral side on opening/closing.

**Results:** The mean pain scores in children with sleep bruxism and control group were  $2.14 \pm 1.96$  and  $2.52 \pm 1.50$ , respectively and no difference was found between the groups ( $p=0.483$ ). Only 14% of the participants presented joint noise, while 53.5% reported headaches, however, no difference was found between the groups ( $p=0.378$  and  $p=0.352$ , respectively). All other evaluated signs and symptoms of TMD did not differ between the groups ( $p > 0.05$ ).

**Conclusions:** The distribution of TMD signs and symptoms among sleep bruxers children and non-bruxers is similar (OR). There was no association between sleep bruxism in children and TMD signs and symptoms.

**How has the COVID-19 Pandemic Affected the Psychology of Pediatric Dentists, Parents, and Children**

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**Background:** To assess the psychological burden of practicing pediatric dentistry during the COVID-19 pandemic outbreak; on dentists, parents and children.

**Methods:** The study population consists of pediatric dentists, recruited through five pediatric dentists Facebook groups. A web-based questionnaire was created; the questionnaire contained closed and open-ended questions, addressing demographic data, dentists' feelings, and how they deal with children and parents in clinic. Descriptive statistical analysis was used to describe items included in the survey. Numbers and percentages were used to describe categorical data.

**Results:** 202 dentists responded to the questionnaire of which 141 dentists are actively practicing during the pandemic. 85.1% of practicing dentists felt anxious regarding their own safety, and for 61.7% of them, this may affect their attitude and tolerance with a child patient. 57.5% of respondents felt that the general stressful situation of the pandemic is affecting/may affect their attitude and tolerance with child patient. 68.8% and 93.6% thought the situation will/may affect child's and parents' attitude in dental office respectively. The effect of the sight of advanced PPE on children; had no effect (27.7%), interesting and curious (31.9%), apprehensive (30.5%). 56% of dentists reported the use of basic management techniques as usual, and only 42.6% would use tell-show-do technique and allow patients to touch dental instruments. 47.5-73% indicated not using advanced management techniques during the pandemic.

**Conclusions:** The stressful environment created by the pandemic is affecting dentists and parents more than children. This situation may limit the options usually used by dentists to manage children.



### **Assessment of Behavioral Determinants of Infant Oral Hygiene Practices Amongst Children Attending Anganwadi in a Rural Part of Nagpur**

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**Background:** In developing countries, dental caries is the most common disease of the early childhood. Its increased prevalence in younger age group can lead to oral health problems in the future. Infant oral hygiene plays an important role in prevention of dental caries in children. Assessing parental behavioral determinants in relation to infant oral hygiene practices can help design a health promotion plan for appropriate infant oral hygiene practices.

**Methods:** A study was carried out in Anganwadis of Hingna, Nagpur region over a period of two months. One-to-one interviews were conducted with parents of young children. The questionnaire included open ended questions related to infant oral hygiene like when, why they started infant oral hygiene practices and the barriers they faced in effective delivery of same.

**Results:** A total of 50 parents were interviewed, out of which 43 reported that although they were aware of cleaning gum pads and newly erupted primary teeth, they could not follow the practices. These parents were more fearful of hurting the child while cleaning the oral cavity. In addition they didn't know how to overcome the fear of cleaning oral cavity in children or managing a fussy child during oral hygiene practices. Several showed lack of motivation regarding infant oral hygiene practices.

On the contrary, few parents performed proper cleaning of gumpads and newly erupted teeth with high self-efficacy and tried to overcome barriers to carry out oral hygiene practices.

**Conclusion:** The outcome supports an integrative structure in which barriers for parents` to maintain infant oral hygiene practices are multiple and vary among individuals. Knowledge of these specific behavioral determinants for parents could strengthen oral hygiene practices of infants and toddlers. Proposals to solve these issues include community based childhood programs that will target specific needs of parents and personalized infant oral hygiene practices targeting skills of parents.

## A Community Survey on Maternal Perception about the Initiation of Dental Home for Infants in Lagos, Nigeria

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**Background:** Children who have a dental home are more likely to have preventive and routine oral care. This study aimed to determine the perceptions and practices of mothers with regards to the establishment of dental home in Lagos, Nigeria.

**Methods:** a community-based descriptive household survey conducted amongst mothers in Lagos. Socio-demographic data, information about the importance of primary teeth, knowledge about dental home as well as their child's age at first dental visit and reasons for attending was obtained with an interviewer-administered questionnaire. Descriptive statistics, Chi-square and multivariable regression analysis were conducted, P 0.05.

**Results:** The highest proportion of the mothers were aged between 26-30 years (27.4%; mean age: 34.58±7.8 years). Most respondents (n = 180, 51.4%) did not know the age for a child's first dental visit and had not taken their child for any dental visit (n = 229, 65.4%). Among those whose children had previous dental visits, the greater proportion (n = 115, 95.0%) had their first dental visit at 1 year of age Overall, only 126 (36.0%) respondents had a good perception about oral health and the need for a dental home while 224 (64.0%) respondents had poor knowledge. Mothers with tertiary levels of education (OR =0.108; CI =0.0023- 0.495) and those with 2-3 children (OR =0.482; CI =0.253- 0.920) had significant lower odds of poor perception about the importance of a dental home.

**Conclusion:** Maternal knowledge and practices with regards to dental home were poor and inadequate. It is necessary to create more awareness among parents/caregivers, to establish the concept of dental home.

Cariology and Preventive Dentistry, Infant Oral Health

### **Health Promotion in Pediatric Dentistry Using Audiovisual Tools: The Milk-Tooth Project, an Initiative of Brazilian Pediatric Dentists**

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**Background:** In childhood, the development of ludic activities is one of the most important resources for learning and knowledge construction. Therefore, in Pediatric Dentistry, these activities should be adopted whenever possible, as a wise form of oral health promotion and education. The aim of this work was to produce and record children's songs, in Portuguese, with health promotion and education content, as well as to quantitatively assess its audience after dissemination on social media platforms.

**Methods:** The project's songs were written by Prof.<sup>a</sup> Dr. <sup>a</sup> Alexandra Mussolino de Queiroz and masters student Paôla Caroline da Silva Mira, from the Department of Pediatric Dentistry, School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil. All songs were designed and produced to stimulate the child's approach and oral health themes in a playful, funny and artistic way. After musical production by specialists in children's music, the songs were released on social networks (Facebook, Instagram and YouTube). Data generated by these platforms were used for quantitative assessment of the scope of this educational work.

**Results:** Five months after the audiovisual content's release, the "Milk-Tooth Project" page reached approximately 19,650 people, with access spread over 15 countries, 11 states and 45 Brazilian cities.

**Conclusion:** The quantitative results showed that the songs produced covered an immense territory and widely reached people from different parts of the world, positively influencing health professionals, Pediatric Dentistry professors, undergraduate and graduate students, parents and children.

## Evaluation of the Orofacial Pain Threshold in Children and Adolescents With and Without Sleep Bruxism: A Cross-sectional Study

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**Background:** Sleep bruxism is characterized by a rhythmic activity of the masticatory muscles during sleep. However, there is a lack in the literature when it comes to the association between sleep bruxism and orofacial pain. The aim of the present study was to compare the orofacial pain threshold through pressure algometry and average pressure rate between children with sleep bruxism and control a group.

**Methods:** A total of 42 participants (21=sleep bruxism; 21=control group), aged 8 to 15 years were included in this study. Both groups were submitted to pain threshold assessments with the aid of a pressure algometer, in three different areas: TMJ area and the muscle masseter and temporalis, in both right and left side. A multilevel negative binomial regression analysis ( $\alpha=5\%$ ) was performed to investigate the association of pain thresholds (Kpa) and average pressure rate (Kpa) between independent variables (group, area, side, age and gender).

**Results:** There was no difference between patients with sleep bruxism and control group in relation to both pain thresholds and average pressure rate ( $p0.05$ ). However, there was a difference between the areas evaluated and pain thresholds, where the KPa values were higher for temporalis muscle when compared to masseter (IRR=1.08; CI=1.00-1.16) and TMJ area compared to masseter (IRR=1.14; CI=1.05-1.22). There was no association between any of the outcomes with age, gender and side ( $p0.05$ ).

**Conclusion:** There was no difference in the orofacial pain threshold through pressure algometry between children with sleep bruxism and control group. Masseter muscle had a lower pain threshold when compared to the other evaluated areas.

### Treatment of Childhood Bruxism: A Systematic Review

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**Background:** Bruxism is an involuntary parafunctional, rhythmic and spasmodic activity of the masticatory system produced by rhythmic or tonic contractions of the masseter and other mandibular muscles. The aim of this present study was to carry out a systematic review of the main studies that can contribute to the treatment of sleep bruxism in children, between 0 to 12 years, in order to offer assistance to professionals in the field.

**Methods:** Through specific terms was reviewed in *PubMed*, *SciELO*, *Lilacs* and *Web of Science* databases, and a selection of articles was carried out by two independent examiners. The most relevant ones were selected from 1988 to 2017 and they dealt with the treatment of bruxism in children.

**Results:** Of the 1479 articles found, after the removal of duplicates, 1150 remained. After screening, 25 articles were chosen for full reading. Of these, 10 were excluded for being outside the established age range or for not addressing treatment. Therefore, 15 articles were selected.

**Conclusion:** Based on articles found in the literature, it can be concluded that the ideal treatment for bruxism in children is based on multidisciplinary therapy. So, the pediatric dentistry with the help of psychologists, pediatricians and otolaryngologists promising results can be achieved.

### Peripheral Facial Paralysis: A Case Report in a Healthy Girl

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**Introduction:** Peripheral facial paralysis is the most common paralysis of the seventh cranial nerve with rapid onset and unilateral consequences. This paralysis is characterized by the loss of sensibility and movement of the affected side.

**Case report:** A 12 years-old female came to a Pediatric Dentistry appointment for a routine consult, complaining about differential growth of her chin to the right. Intraoral and extraoral examinations were normal for the patient's age. After 2 weeks she returned and reported pain of the posterior right side of her neck. It was verified that the right side of her face was paralysed and that she couldn't smile, fully close her right eye or rise her right eyebrow. She had itching of her lower eyebrow and her eye was constantly crying. This condition was reported to have begun 3 days prior to the appointment and has been progressing since.

The child was referred to a central pediatric hospital and was prescribed corticosteroids. She will be assigned for rehabilitative approaches.

**Discussion:** It's mandatory to listen to pediatric patients and try finding the origin of their complaints. The original complaint was the first sign of the nerve injury. She was medicated in 3 days, in the optimum time for best prognosis.

**Conclusion:** Bell's palsy is the most frequent form of facial paralysis in children and the majority of cases has a favorable prognosis with spontaneous resolution. This disease causes significant concerns both in doctors and parents, mainly due to the functional and aesthetic outcomes.

### **Effects of Milk and APF-gel on the CaF<sub>2</sub> Uptake, and on the Inhibition of Caries Lesion Progression – In Vitro Study**

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**Background:** It is unknown if the availability of calcium ions from milk in combination with APF-gel application increases the formation of calcium fluoride and enhances the inhibition of lesion progression. The purpose of this in vitro study was to evaluate if milk combined with APF-gel application could enhance the CaF<sub>2</sub> uptake and reduce the mineral loss in enamel with early caries lesion.

**Methods:** Demineralized bovine enamel specimens were assigned to four groups (n=28/group): APF-gel alone, Milk alone, Milk + APF-gel, and APF-gel+ Milk. CaF<sub>2</sub> was quantified (n=12), and scanning electron microscopy (SEM) was performed in two samples. Fourteen specimens were submitted to a 5-day pH cycling. Transversal microhardness and polarized light microscopy (PLM) analyses were performed. Results were analyzed by One-way ANOVA and by Tukey test.

**Results:** Regarding CaF<sub>2</sub>, the APF-gel + Milk was more efficacious than APF-gel alone and Milk alone. MEV images show a higher CaF<sub>2</sub> formation on the enamel surface after APF-gel + milk. Transversal microhardness data showed that APF-gel alone and APF-gel + milk showed lower mineral than milk alone. PLM images showed a remineralization area in groups with APF gel.

**Conclusion:** APFgel alone and combined with milk after fluoride were effective in reducing lesion progression. The combined treatments showed a synergistic effect for CaF<sub>2</sub> formation, but not for inhibition of caries progression.

**Salivary Metal Profile of Vulnerable Children in Brasilia, Brazil**

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**Background:** Contamination of the environment by heavy metals is an important public health issue, which can permanently compromise the health and quality of life of those who come into contact with these substances. In this context, children are often more affected, since they are developing and, consequently, are more subject to the effects of these contaminants. Despite this, there are few studies in the literature, which address the salivary characteristics resulting from environmental contamination. Therefore, the objective of this research was to determine the predictive factors of the health problems of children living in a contaminated area, by quantifying, in saliva, the following chemical elements: Pb, Cd, Na, K, Mg, Ca and correlating the results obtained with caries index (DMFT).

**Methods:** Forty children between 6 and 12-years-old, living in Brasília, whose parents were recyclable material collectors, were selected. The chemical elements were analyzed by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). Student's t-test or Mann-Whitney and multiple linear regression models were used. Results were expressed as a partial correlation coefficient.

**Results:** The average value of the concentration of Na and Mg was 254.32 +/- 122.23, respectively; with 95% CI (215.23 to 293.41) and 2.77 +/- 1.01; with 95% CI (2.45 to 3.10). Girls showed higher concentrations of Pb than boys ( $p = 0.0223$ ). In children with salivary Pb content greater than 0.30  $\mu\text{g} / \text{L}$ , the prevalence of health problems was 4.57 times higher than in children, whose Pb content was less than 0.30  $\mu\text{g} / \text{L}$ . There was a significant correlation between Cd concentration and DMFT ( $r = 0.412$ ;  $p = 0.0091$ ).

**Conclusions:** The inorganic salivary profile was changed for Na and Mg, for which the values were lower than those indicated in the literature. Girls were probably more exposed to Pb than boys. Salivary Cd was directly related to DMFT. Further studies are needed to better clarify the influence of the chemical elements analyzed.



**Relationship of Obesity with Dental Trauma in Preschool Children: A Case-control Study**

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**Background:** Traumatic Dental Injuries (TDI) are very prevalent in primary dentition and can have a negative impact on the quality of life of preschool children and their families. Obese children are more prone to fall, which increases the chances of physical injury. Thus, the objective of this case-control study was to determine the association between obesity/overweight and TDI in preschool children.

**Methods:** The case group was selected from those children with TDI identified by clinical examination (n = 262). Each preschool identified as a case was paired through a drawing with a colleague of the same age, sex and preschool, but who did not have TDI, the control group (262). TDI were assessed using the Andreasen criteria and the presence of an increased overjet was considered when  $\geq 3$ mm. The children's weight and height were measured to calculate the Body Mass Index. Sociodemographic and sucking habits variables were collected through questionnaires. Data analysis involved frequency distribution, chi-square test and univariate and multivariate logistic regression.

**Results:** The final sample consisted of 253 children in each group. Among the children in the case group, 32% (n= 81) were obese and in the control group 22.5% (n= 57). Obese children were more likely to have TDI than children with normal weight (OR=1.54; 95%CI:1.02-2.34; p=0.03). The anterior open bite was considered a risk factor for TDI (OR=3.47; 95%CI:1.58-7.63; p=0.002), as well the increased overjet (OR=2.26; 95%CI:1.42-3.60; p=0.001).

**Conclusion:** Obese children were more probability to have TDI in primary teeth than children of normal weight.

**Baby Oral Health Promotion Clinic: A Successful Model for Prevention of Early Childhood Caries**

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**Background:** Early childhood caries (ECC) is the most common chronic diseases of the oral cavity affecting the children less than 71 months of age. In both developed and developing countries, this is a serious public health problem especially for a low socioeconomic group of population. To prevent ECC, children with high risk for caries must be identified at an early age and aggressive strategies must be adopted.

**Methods:** A longitudinal cohort design was adopted to evaluate the effectiveness of establishing Baby Oral Health Promotion Clinic in reducing the burden of ECC. The children visiting Pediatric OPD for immunization were screened and 150 children were recruited for this study. All the parents in the study were given oral health education through a one to one counseling. To reinforce the oral health education, oral health pamphlets were also provided. Intraoral examination was conducted at birth and at 3 monthly intervals for a period of five years. On completion of one year, each child was assessed for caries risk using caries risk evaluation form.

**Results:** Among the 150 recruited subjects, 45 subjects were lost for follow up. A total of 105 children were followed up from birth to five years. Out of 105 subjects who were followed up 37% of them had the risk of developing caries and 1.9% actually developed ECC suggesting that 98% of children were caries-free at the end of 5 years follow up.

**Conclusions:** The model discussed here appears to be a practical, cost-effective, evidence-based, and population-specific. Baby Oral Health Promotion model proved to be a successful for the prevention of ECC.

### **Raising Parental Awareness of the “Dental Check By One” Scheme by Educating Hospital and Community Midwives**

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**Background:** Dental check by One, (DCBy1) is a child oral health scheme developed to educate and encourage parents to take their children to the dentist before the age of 1. Many parents lack knowledge on the importance of oral health and how to prevent problems such as dental caries. The aim was to improve the knowledge and understanding of hospital and community midwives associated with The Royal London Hospital on the DCBy1 scheme. The objective was to assess oral health knowledge and understanding amongst non-dental medical staff and if oral health advice is currently being given to parents, and to educate maternity colleagues and implement changes required to support staff with delivery of oral health education to parents and promote DCBy1.

**Methods:** Pre-training questionnaires were completed by attendees, midwives and community health visitors and staff involve in delivering antenatal classes. Training sessions were completed, and to evaluate the effectiveness of the training all members were asked to complete a post-training questionnaire and feedback forms.

**Results:** Training was delivered to 39 people altogether over 4 sessions within a 3-month period. 39 pre-training questionnaires and 35 post-training questionnaires were completed. Overall, there was an improvement in 100% of questions after the training sessions.

**Conclusion:** We believe the project so far has been a success and we aim to continue promotion of the campaign by providing certificates in postnatal packs, developing a presentation to be shown in the maternity department waiting room, meeting with the breast-feeding team and facilitating oral health promotion in local children centres.

**Current Treatments for the Management of Oral Mucositis in Pediatric Cancer Patients**

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**Background:** Oral mucositis (OM) is an inflammatory response of mucosal epithelial cells to the cytotoxic effects of chemotherapy and radiation therapy. Children and adolescents are more sensitive to OM due to the rapidity of cellular mitosis and to specific intensive chemotherapy regimens.

**Literature Review:** To investigate the approaches for the treatment of OM in pediatric cancer patients, fifty studies in MEDLINE (via PubMed) between 2010 and 2020 were evaluated. Research inclusion criteria were: scientific papers on children (0-18 years old) undergoing cancer treatment and the methods used in the treatment of OM developing in these patients. Twelve of the fifty studies evaluated met the inclusion criteria. The treatment approaches for OM were as follows: Low-level Laser Therapy (LLLT) application, Palifermin, Honey, Honey Mixture with Olive Oil-Propolis Extract, Propolis, Caphosol, Verbascoside, Polyvinylpyrrolidone and Sodium Hyaluronate (Mucosyte rinse) and Curcumin. According to the literature, Caphosol and Propolis are not effective in the treatment of severe OM. Most of the studies showed that LLLT are capable of reducing the severity of oral mucositis. It has been reported that all other applied materials are safe, well tolerated and effective in reducing the severity of OM.

**Conclusions:** Several studies have been carried out to find an effective treatment for mucositis and its associated pain. There is no single evidence-based approach for the prevention and treatment of OM in pediatric patients undergoing cancer treatment. New traditional alternative medicines and agents which contribute to epithelial restitution and repair are promising alternatives for treating cancer-induced mucositis.

**Restoration of Oral Function in Preterm Low Birth Weight after Prolonged Orotracheal Intubation**

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**Introduction:** It is well established in the literature that the neonatal intensive care, such as artificial ventilation through oro-tracheal intubation may cause some important changes in the oral anatomy and functions. The purpose of this report is to present the transdisciplinary treatment of the oral alterations in an extremely preterm and low weight infant (596 g) who remained with oro-tracheal intubation during 2 months and 5 days of corrected age.

**Case report:** An extremely preterm and low weight (596g), 24 weeks suitable for gestational age, who developed respiratory distress syndrome complicated by pneumothorax and bronchopulmonary dysplasia, remaining on mechanical ventilation for 74 days, nasal CPAP for 14 days and home oxygen dependence. Also presented difficulty in the introduction and progression of the enteral diet, presenting necrotizing enterocolitis with intestinal resection, compensated food intolerance with the use of extensively hydrolyzed formula and incoordination with breathing-suction-swallowing. During hospitalization, received parenteral nutritional support for 46 days and then started speech therapy for enteral diet transition up to approximately 36 weeks of corrected age. Discharged from the hospital with nutritional hypercaloric diet support through a naso-gastric tube, with 2 months and 5 days of corrected age, weighing 3780g and 51cm long. An orofacial motor therapy was carried out by speech therapist and pediatric dentist. Breastfeeding was intensively worked out, as well as oral exercises performed by different nozzles and digital compression therapy to stimulate the growth of the premaxilla, palate and mandible. Monitoring the teeth eruption, the diet and different textures was oriented to adapt the symmetrical growth of the arches.

**Discussion:** Since the long period of the use of a nasogastric tube and mechanical ventilation can cause changes in function and oral anatomy, an orofacial motor therapy is important to establish the oral function after a long period of intensive care.

**Conclusion:** After the orofacial motor therapy carried out with the transdisciplinary team including a pediatric dentist, the patient presented a very satisfactory evolution of oral development, presenting arches with harmonic growth, normal palatal anatomy and good dental occlusion.

**Comparative Study of a Cariostatic and Fluoride Varnish in the Paralysis of Initial Caries Lesions**

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**Background:** Caries is a multifactorial disease, dependent on the presence of biofilm. Due to the possibilities of paralysis methods and initial diagnosis of caries, this study aimed to compare the efficacy of silver diamine fluoride (SDF) with fluoride varnish in first permanent molars at different stages of eruption by means of a randomized clinical trial.

**Methods:** A randomized clinical trial was conducted to select 165 children between 6 and 12 years of age who presented with carious lesions with ICDAS codes 1 and 2 on the molar occlusal surface. The sample was randomly divided into two groups: G1 (38% SDF potassium iodide-associated) and G2 (5% fluoride varnish). The lesions were classified using ICDAS and according to the stages of eruption. Re-evaluation of the indices and control of the interventions were performed after 6 months.

**Results:** G1 teeth were significantly more frequent in the 0 eruption stage compared to G2 teeth ( $P = 0.009$ ). Thus, G1 had 73 and G2 66 teeth. There was no significant difference between the groups regarding the eruption stage after the intervention ( $P = 1.000$ ). G1's teeth had a significantly higher frequency in the 0 ICDAS score when compared to G2's.

**Conclusion:** The eruption stage of the teeth was not associated with ICDAS in any of the groups analyzed after the interventions. SDF was more effective in stopping caries when compared to fluoride varnish.

**Laser Therapy in Pediatric Dentistry for the Treatment of Herpes Simplex: Case Report**

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**Introduction:** Herpes (HSV-1) is a frequent viral infection that occurs through direct contact with the lesion or infected body fluids. After contamination, the virus travels through epithelial cells and lodges in the trigeminal ganglion, remaining in a latency phase. When activated, they migrate to the extra and intra buccal region, causing new manifestations with a cycle of seven to 14 days. The stages of herpes are prodromal, vesicle, ulcer and crust. With the low-power laser, it is possible to act on all stages of herpes, improving the lesion or inactivating the virus.

**Case report:** A six-year-old patient presented with a recurrent herpes lesion in the lower and upper lip region, in the vesicle phase. The proposed treatment was photodynamic therapy, where the vesicles were ruptured, associating a photosensitizer with a red laser, 3J per point. The results obtained were achieved with 3 days of application. After 32 hours, the lesion was in the crust phase.

**Discussion:** There are several drugs indicated for treatment of herpes, but its efficiency occurs in the prodromal phase. The laser, in turn, can be used at any stage of HSV-1, alternating protocols according to the stage of the injury.

**Conclusion:** The use of laser to treat Herpes was satisfactory, with a break in the cycle of the lesion, showing improvement in 24 hours. In addition to bringing greater comfort to the patient, it is an easily applied non-invasive therapy and with beneficial results.

### Lingual Frenectomy with High-Power Diode Laser: A Case Report

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**Introduction:** Ankyloglossia is defined as a congenital anomaly characterized by a short and/or abnormally thickened lingual frenulum that restricts mobility of the tongue. In children, it can result in important speech disorders, swallowing and sucking abnormalities, difficulty licking food and lips, social adversity, as well as orthodontic and orthopedic anomalies. BTAT test (Bristol Tongue Assessment Tool) was used to diagnose ankyloglossia.

**Case Report:** The aim of this study is to report the case of a 5 years old child with ankyloglossia with phonetic anomalies and bullying treated at the pediatric dentistry clinic in which high-power diode laser (TW Surgical MMO, Brazil)(980 nm) using optic-fiber in contact mode (400 µm), with power of 1.0 to 1.5 W, continuous operation regime. Immediately after the procedure, the wound was irradiated by low power laser (660 nm) (Laser Duo, MMO, Brazil) (2 J per point) to promote photobiomodulation of cells and tissues, analgesia, anti-inflammatory and healing.

**Discussion:** The frenectomy is a kind of surgical treatment commonly recommended for patients who present ankyloglossia. The literature especially on pediatric patient shows the benefits in the use of laser in surgery as coagulation, control and precise incision, visualization, reduction of the operative time, signs and symptoms after surgery.

**Conclusion:** Based on the present report, it was concluded that the frenectomy performed with high-power laser promoted trans and postoperative benefits and the low power laser provided a satisfying and efficient process of tissue repair.



**Born with a Pink Lump in the Mouth: A Case Report of Congenital Mucocele**

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**Introduction:** Mucoceles are common benign lesions of the oral cavity involving salivary glands and their ducts, typically presenting as a single asymptomatic dome shaped or spherical nodules or papules, especially on the lower lip. It usually develops as a result of retention or extravasation of mucous material from minor salivary glands.

**Case Report:** A full-term, fit and healthy 5-month-old baby girl was brought to the Department of Paediatric Dentistry, Hospital Sultanah Aminah, Johor Bahru, Malaysia, for the management of a swelling over the lower lip. The swelling was present at birth, pedunculated and fluctuant which progressively increased in size with no obvious local etiology. Swelling did not interfere with feeding and had no history of rupture. The history, clinical presentation, and differential diagnosis suggested a provisional diagnosis of congenital mucocele. The swelling was surgically excised under general anaesthesia and histopathological examination showed that it was a mucous extravasation mucocele.

**Discussion:** In a dentate individual, mucoceles are usually caused by mechanical trauma from teeth, which is why congenital mucocele is rare due to the lack of teeth. However, some authors have considered birth trauma as the cause of congenital mucocele such as (i) intrauterine finger suction, (ii) passage through the delivery canal, (iii) forceps usage, and (iv) paediatricians manipulation of the baby

**Conclusion:** Congenital mucoceles are very rare. These lesions in newborns may interfere with breastfeeding and may even compromise respiratory function. Early clinical assessment allow clinicians to diagnose and treat this rare congenital condition with surgery in early infancy.

## Restorative Treatment of Minimal Interventions Improves the Masticatory Performance of Preschool Children

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**Background:** The aim of the present study was to assess the effect of restorative treatment on the masticatory performance (MP) of preschool children with cavitated carious lesions on posterior teeth and compare MP after treatment to that of a group with a healthy dentition that did not undergo any intervention.

**Methods:** A longitudinal study was conducted with 58 children four and five years of age with cavitated lesions on posterior teeth who composed the intervention group. These children were matched for sex and age with children who had sound posterior teeth and composed the non-intervention group. The evaluation was performed on two occasions: prior to treatment in the intervention group and 15 days after the end of treatment. The assessment of MP was performed using an artificial test food for the calculation of median particle size (X50).

**Results:** Differences in X50 were found between the groups at both the first ( $p = 0.003$ ) and second ( $p = 0.020$ ) evaluations, with the non-intervention group exhibiting better MP. However, the delta of the X50 was lower in the intervention group ( $p 0.001$ ), indicating a greater improvement. In the multiple regression model,  $\Delta X50$  was influenced by the number of restored teeth ( $\beta = -0.391$ ;  $p 0.001$ ).

**Conclusions:** Restorative treatment has a positive effect on MP, as demonstrated by the greater improvement in the intervention group.

**Children with Molar-Incisor Hypomineralization can Present Pain and Anxiety?**

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**Background:** Molar-Incisor Hypomineralization (MIH) is a qualitative defect of dental enamel that affects at least one first permanent molar and is often found in permanent incisors. As fundamental characteristics, MIH presents demarcated opacities, of variable color, from white to yellowish/brownish. In some cases, post-eruptive enamel breakdown can occur. Increased risk of dental caries, long-term hypersensitivity, anxiety and impact on quality of life can occur in these patients. The aim of this study was to evaluate the association between dental pain and anxiety in children who presented MIH.

**Methods:** 168 children participated in the study, with dental pain assessment using the Visual Analogue Scale and Faces Scale; anxiety and fear has been assessed using the questionnaire "Research schedule on child fear - dental subscale" translated and validated in Portuguese. A chi-square and ANOVA test was performed, followed by the Tukey post-test, with a significance level of 5%.

**Results:** There were no reports of pain by 101 children (60.1%), while 67 children (39.9%) reported pain. In addition, the average level of anxiety for children who were not reported pain was 27.6 (SD 12.4) and for those who reported pain, the average level was 28.9 (SD 9.9). Significant statistical difference ( $p = 0.483$ ) was not observed between the factors pain and anxiety.

**Conclusions:** There was no association between pain and anxiety in patients with MIH.

**Bullying is Associated with Possible Sleep Bruxism in School Children**

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**Background:** The child who is incorporated into the school environment can be exposed to embarrassing situations of discrimination and exclusion, such as bullying. Some studies have shown that bullying can trigger sleep bruxism as a way to release tension. The objective of this study was to investigate the relationship between bullying and Possible Sleep Bruxism (PSB) in children between 6 to 10 years of age.

**Methods:** This was a cross-sectional study, conducted with 386 children from public schools in the city of Diamantina, Brazil. Questionnaires were sent to the children's parents to obtain sociodemographic information, oral habits and medical history. The PSB was determined based on the parents/caregivers report of the occurrence of tooth tightening/creaking during sleep. This data was obtained through a question from the Children's Sleep Habits Questionnaire (CSHQ). Other questions related to the child's sleep were evaluated, such as the amount of hours the child sleeps and difficulty breathing during sleep. Bullying was evaluated using the Olweus Bully Victim Questionnaire. Hierarchical Poisson regression analyses were carried out using the stepwise method to associate the PSB with the independent variables.

**Results:** In the final regression model it was observed that the prevalence of PSB was lower among male children (RP:0.67; 95%CI:0.49-0.90;p=0.01). The report that children seemed to stop breathing during sleep was associated with a higher prevalence of PSB (PR:2.13; 95%CI:1.52-2.98;p0.01). Children who reported bullying had a higher prevalence of PSB (PR:1.57; 95%CI:1.09-2.25;p=0.01).

**Conclusions:** Children who had experienced some episode of bullying had a higher prevalence of PSB.

### 30 Years Later: Oral Microflora in Natural Newborns Postbirth

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**Background:** When the baby crosses the birth canal, there is a drag of germs from the vaginal tract into the oral cavity, so it is very important to identify the first microbial colonization as well as monitor its development to maintain good oral health in the newborn. The present research work aims to compare the microbiological findings in the mouths of newborns after natural birth after 30 years.

**Methods:** This study compares two investigations carried out in different periods. For both investigations, samples were collected from the oral cavity of 50 neonates post natural delivery, which were carried out to isolate and identify the oral microflora bacteria and the same inclusion and exclusion criteria were taken into account.

**Results:** To the microbiological report, both studies corroborate the presence of *Escherichia Coli*, and *Staphylococcus Epidermidis* in the oral cavity of the newborn; however, in the 1988 study the finding of other microorganisms such as: *Enterobacteriaceae* and *Kleibisella* was also reported, the results in the presence of fungi and parasites were negative in both studies.

**Conclusion:** There are similarities in the microbiological findings of both studies, with colonies of gram + coconuts (*Escherichia Coli*) prevailing, and the longer the time of delivery, the greater the probability of microorganisms.

**Upper Lateral Incisor Agenesis in Deciduous and Permanent Dentition: Case Study**

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**Introduction:** Agenesis of the maxillary lateral incisors (ILS) can cause asymmetries in the patient's smile, causing a negative aesthetic impact. Because they involve the anterior region, patients and their families feel uncomfortable with the diastemas and poorly positioned canines. This aesthetic impact can have psychological and social consequences for patients, especially in childhood.

**Case Report:** Girl, two years and four months old. The mother expressed concern about her daughter smile. Occlusal and periapical radiographs showed the absence of the deciduous teeth 52, 62 and their permanent successors teeth. Considering that the child is very young, it was decided to accompany the development of the occlusion until an ideal period of orthodontic intervention. Guidance on hygiene and oral health were given.

**Discussion:** In cases where aesthetics and function are compromised, orthodontic and prosthetic treatment may be used, however, in young patients, a less invasive approach is critical. There are consequences that may occur in the permanent dentition due to ILS agenesis, such as canine ectopic eruption and Class III development due to maxillary hypoplasia. In the current report, there is a possibility of such complications due to the absence of deciduous and permanent ILS.

**Conclusion:** Anterior agenesis can cause aesthetic, phonetic and functional problems in patients, leading to social impacts. The early diagnosis helps in treatment possibilities and to clarify and calm the anxiety of children and their families.

**Use of High and Low-level Laser Devices for Mucocele Treatment in an Infant Patient: Case Report**

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**Introduction:** Mucocele is a benign lesion of minor salivary glands which indicated treatment is surgically removing. The high-intensity laser therapy (HILT) is a surgical option despite the advantages in post-surgical. Moreover, the low-level laser therapy (LLLT) improves the healing process. The objective of this study was to report a case of mucocele removal associating HILT and LLLT.

**Case Report:** 11-years-old female child attended the FOB-USP Pediatric Dentistry Clinic with main complaint of a “little hard ball under the tongue”. After medical history and clinical exam, the diagnostic hypothesis was mucocele. Surgical excision was performed using a HILT (Thera Lase Surgery – DMC): after topical and infiltration anesthesia, with the laser in its pre-programmed function for soft tissue surgery, the mucocele was removed and sent for histopathological analysis. Then the LLLT (Twin Flex - Mmoptics) was used to assist in the process of repair, since there was no need for suturing. The applications were repeated after 24 and 48 hours. Seven days later, in the control appointment, there was no report of postoperative pain and the region was well healed. The patient reported satisfaction with the techniques and procedures used. Histopathological examination confirmed the diagnostic hypothesis of mucocele.

**Discussion:** HILT associated with LLLT for the treatment of mucocele provide a better surgical technique and more comfort during and after operation, besides a satisfactory healing process.

**Conclusion:** This case report showed that the association of laser therapies on surgical treatment is an excellent alternative for a pediatric patient.

**Social Risk Factors That Affect Health in Patients Under 18 Years of Age: Literature Review**

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**Background:** Various social risk factors affect the oral health of the pediatric population. Emphasis has been placed on its intervention from early stages although its study is complex in the child population, due to the lack of appropriate indicators. Considering them is essential when considering public health interventions.

**Literature Review:** The objective is to describe the social risk factors that affect oral health in patients under 18 years of age, according to the scientific literature. A narrative review was performed by electronic keyword search in EBSCO, PubMed, LILACS and JSTOR databases, in English and Spanish, with no year limit. Inclusion criteria; systematic and narrative reviews, cohort and ecological studies, in population under 18 years, with reference to caries diagnosis, periodontal disease and dentomaxillary anomalies in association with social risk. Studies in patients with systemic pathologies and referred to agenesis and dentoalveolar trauma were excluded. 40 articles were selected: 37 cross-sectional studies and 3 systematic reviews. The most influential social risk factor was family socioeconomic level, associated with three characteristics: educational level and knowledge about oral health of parents, family and housing characteristics, and access to health services.

**Conclusion:** The evidence associates the family socioeconomic level, educational level of the mother or main caregiver, characteristics of the home and family conditions with the oral health of the pediatric population.



### Infant Oral Health Knowledge, Attitude and Practice of Paediatricians

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**Background:** Dental caries is a major public health problem and an important global concern. Paediatricians have frequent contact with families for a child's general health care in their first few years of life.

**Methods:** A questionnaire survey was conducted amongst paediatricians in Nasik city, India. The questionnaire included questions related to the knowledge, attitude and practice of paediatricians regarding infants' oral health. Results of the first cycle were evaluated and discussed at the departmental meeting. The necessary action plan was decided. The second cycle was carried out after a year and results were analysed.

**Results:**

1. Knowledge regarding - Bottle/breastfeeding and early childhood caries, effects of oral habits on teeth, the inheritance of oral/dental problems, the transmission of cavity-causing bacteria between mother and child, prevention of dental caries

First cycle – 67.6% second cycle – 96%

2. Attitude towards – Routine dental visits, caries risk assessment as a part of routine child care, prevention of dental caries, sugar-free medicines, educating parents about oral hygiene habits

First cycle – 99.2% second cycle – 100%

3. The practice of – Referring patient to GDP/Paediatric dentist at 6 months of age for a dental check-up, performing oral health screening, advise on a first dental visit, frequency of oral health examination, starting the use of a toothbrush

First cycle – 40.2% second cycle – 83.8%

**Conclusion:** This clinical governance project lead to improved access to infant's dental care and also contributed to enhance the paediatricians' knowledge, attitude and practice towards infant oral health.

**Melanotic Neuroectodermal Tumor of Infancy: A Case Report Emphasizing the Diagnosis Findings**

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**Introduction:** The melanotic neuroectodermal tumor of infancy (MNTI) is a rare, benign neoplasm, presenting as a pigmented lesion that affects mainly maxilla of infants. MNTI diagnosis is performed by histopathological evaluation and the treatment of choice is surgical removal with large healthy margins. Due to its local aggressiveness, MNTI accounts for potential local recurrence, which can lead to multiples surgical removals and also can be even fatal if involving vital structures. The purpose of this report is to present a successful diagnosis of the MNTI.

**Case report:** S.V.B.S, 4 months-old, female with a rapidly progressive swelling in the left anterior region of the maxilla, with no history of trauma. The lesion was a sessile firm mass with no signs of discoloration or ulceration. Occlusal radiography showed an expansive and radiolucent lesion involving the left incisor tooth. An incisional biopsy was performed and microscopic examination revealed islands of a small round neoplastic melanogenic cells surrounded by a fibrocollagenous stroma. Immunohistochemical analysis reveals expression of cytokeratins AE1/AE3 and CD99+, antigen Ki67, VIM and CROMO, confirming the diagnosis of a MNTI.

**Discussion:** MNTI, firstly described by Krompecher in 1918, can be challenging since its rapid growth rate and the risk of local recurrence. The histopathological analysis reinforced the pattern of this tumor, and the immunohistochemical biomarkers evaluation are relevant in the diagnosis of MNTI.

**Conclusion:** The present report highlights the importance of the accurate diagnosis of Melanotic Neuroectodermal Tumor of Infancy for its proper treatment and better prognosis.

### Oral Health Promotion in Pediatric Dentistry using a Social Media Platform

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**Background:** The promotion of Oral health is a fundamental part of the care of children and adolescents. Within the Faculty of Dentistry, at the University of Chile, this is achieved through an "Educational Room", the objective of which is to provide support for pediatric dental treatment. Due to the pandemic and the confinement, this activity changed from in-person to an online-delivered medium.

**Methods:** To describe the experience of a social media campaign looking at oral health promotion and prevention education. A series of 17 educational modules were created in different formats such as videos, storytelling & infographics and uploaded to the Instagram account @educafouch for dissemination. Analytics were obtained of the visualizations, interactions and scope that each piece of material had.

**Results:** A total of 370 followers were achieved, with an average weekly reach of 577 accounts. The demographics so far are 79% in Santiago, Chile, but it is also displayed in other geographical locations within the country, but in a lower percentage. Similarly, 97% of the followers are from Chile, but there are also followers from other countries.

In terms of demographics, 54% of followers were found to be between 25 and 34 years old, 33% of followers were between 18 -24 years old and 8% between 35 and 44 years old. 75% of the reported demographic were female.

**Conclusion:** Given the results, the objective of giving continuity to oral health promotion and prevention activities was met. The impact and sustainability of this activity over time should be investigated.

### **Riga-Fede Disease: Double Case Report - A Conservative and other Radical**

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**Introduction:** Riga-Fede disease is a traumatic ulceration on the ventral region of the tongue, usually associated with natal or neonatal teeth. This lesion can result in an inappropriate milk suction and feeding, leading the newborn in risk of inadequate nutrients intake. Decision for the radical treatment is taken due the presence of nutritional deficiency and breastfeeding difficulty, in cases of advanced dental mobility, teeth with initial root formation and larger tongue lesions.

**Case report:** Two cases with different treatments a conservative for a patient aged 28 days of life, with little problems during feeding and no weight loss. The other case radical, on a 6 days life patient with inappropriate feeding and weight loss.

**Discussion:** It is possible to consider a variety of opinions regarding the professional procedures which are related to the clinical picture of the neonatal teeth. It is necessary to calm the parents and present them the treatment alternatives, stating that the early intervention of the Pediatric Dentist is important, to relieve pain and provide comfort to the child and the mother during feeding.

**Conclusion:** Supernumerary native or neonatal teeth when related to Riga- Fede disease must be extracted; -Teeth with marked mobility and / or without bone support must be extracted; - Incisal edges are rounded and polished for maintenance of natural and neonatal teeth when in good bone support; -You must not neglect weight loss in newborns; The treatment of wound healing, return of feeding and weight gain; In case of extraction, monitoring is essential to avoid or intercept possible malocclusions.

**Lingual Frenotomy in the Treatment of Ankyloglossia in the Baby: Case Report**

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**Introduction:** The lingual frenum is a mucous membrane located in the sublingual region. Sometimes this structure is very short and / or thick, limiting the movements of the tongue. This condition is called ankyloglossia and can negatively affect the development of the child. Therefore, early diagnosis plays an important role in this condition, as it is directly related to the success of treatment.

**Case report:** A male baby, 6 months old, presented with difficulties in breastfeeding. After medical history and clinical examination, the patient was diagnosed with ankyloglossia, which interfered with normal tongue movements. Frenotomy was adopted as a therapeutic approach. The improvement in tongue mobility can already be noticed in the immediate post-surgical period.

**Discussion:** It is known that changes in the tongue can compromise oral functions. In the case presented, ankyloglossia resulted in difficulty of the patient's breastfeeding, as it compromised the sucking and swallowing movements. There is no consensus in the literature on the ideal age for surgery. To avoid damage of the development of the infant, the diagnosis must be early, and the surgery performed as soon as possible, aiming at the optimization of breastfeeding for the child's full development, giving more comfort to the baby and mother.

**Conclusion:** Ankyloglossia is an easily diagnosed deformity in routine examinations of the oral cavity. Frenotomy is an effective surgical intervention for the treatment of the anomaly, being the most often used technique for babies and children and its results can be seen right after the surgery.

### A Bibliometric Analysis of the 100 most Cited Articles on Infant Oral Health

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**Background:** Bibliometrics aid in providing information on dominant areas of a research field. The purpose of this study was to identify and analyze the 100 most cited articles on Infant Oral Health to accentuate the influential papers and authors over time.

**Methods:** An electronic bibliometric search was performed in the Scopus database on July 27, 2020. The keywords used were "infant oral health", "prenatal oral health", "perinatal oral health", "postnatal oral health", "infant caries", "age one dental visit", and "infant oral wipes". Screening was performed by two independent reviewers (SP and MSM). Consensus was arrived on the top 100 most-cited articles. These papers were then cross-matched with citation data from Clarivate Analytics' Web of Science (WoS) Core Collection and Google Scholar to assess any fluctuation in the citation counts. The articles were categorized according to citation and study characteristics. Analysis and network visualization among the authors, countries, and keywords were generated using VOSviewer software.

**Results:** Among a total of 5619 articles published on Infant Oral Health, top-cited articles appeared in 42 journals, with the Pediatric Dentistry journal (n=29) contributing the maximum number of articles. The papers originated from 19 countries, with the United States (n=49) accounting for the largest number. The University of North Carolina (United States), affiliated the most articles (n=12). In terms of document type, 77 were original research, 18 reviews, 4 conference papers, and 1 editorial review.

**Conclusions:** The findings of this research will serve as an important source of information for the researchers, clinicians, and students for evidence-based clinical decision making.

**Oral Health Attitude and Knowledge of The Primary Caregivers of Infants with High Caries Risk**

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**Background:** This study aimed to investigate the oral health attitude and knowledge of the primary caregivers of one-year-old infants with high caries risk in Hong Kong.

**Methods:** Infants aged one-year-old with high caries risk and their primary caregivers were recruited for an ongoing randomized controlled trial. A self-completed questionnaire was used to collect information about the caregivers' sociodemographic background, oral health attitude and knowledge at baseline.

**Results:** A total of 579 parent-infant dyads were recruited. The children were 12-16 months old. Over half of the caregivers (53.7%) did not have any previous oral health education. The caregivers' mean oral health attitude score (AS) for adult oral health care was  $7.0 \pm 1.0$  (Range: 3-8), and their mean AS for infant oral health care was  $9.1 \pm 2.0$  (Range: 1-13). Caregivers who claimed to have no oral health problem had a higher mean AS for adult oral health care ( $P=0.030$ ), and for the infant oral health care ( $P=0.014$ ). Only 16.2% of the caregivers knew how to brush their babies teeth correctly. One-third of them thought they could clean infants teeth when they were asleep.

**Conclusions:** Primary caregivers who had prior oral health knowledge showed a more positive oral attitude and were more willing to keep good oral hygiene for their infants. The oral health knowledge, in particular toothbrushing for infants, was inadequate. Oral health education should be introduced to the primary caregivers at an earlier stage so to improve infant oral health.

### A Congenital Epignathus in a 3-day old Neonate

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**Introduction:** Congenital epignathus teratomas are rare benign neoplasms often composed of tissues from the three germ layers. They can present in the nasopharynx, oropharynx or more rarely in the oral cavity alone. They are benign but can be associated with breastfeeding issues, a failure to thrive and airway obstruction. A review of the literature suggests early resection as the preferential management due to functional and aesthetic reasons. This report presents a case of epignathus affecting a 3-day old girl.

**Case Report:** This patient presented to an Accident and Emergency department with jaundice and 12.5% weight loss because of poor feeding due to an oral mass. Urgent referral to OMFS was made who noted a 2 x 3 cm pedunculated firm painless mass on the left mandibular alveolus causing impaired latching. Antenatal scans and maternal medical history were clear. No immediate airway obstruction was evident. Nasogastric feeding, triple phototherapy and support from the breast-feeding team helped resolve feeding issues, weight was gained and mother and child sent safely home. Out-patient follow up was undertaken to check for changes in the lesion and plan future resection. Clinical photographs aid to illustrate this case.

**Discussion:** This case emphasises the importance of liaison with the breast-feeding support team to help reduce the need for emergency general anaesthetic and surgery in the neonate.

**Conclusion:** Breast feeding support teams may successfully aid the management of neonatal patients presenting with sizeable oral lesions.



### Factors Associated with Specific Temporomandibular Disorders Diagnostic in Brazilian Adolescents

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**Background:** Temporomandibular disorder (TMD) is a heterogeneous group of joint and muscle disorders in the craniofacial region, that can begin to develop through adolescence. This study aimed to assess the association of specific TMD diagnostics with sociodemographic factors, health-related, and oral conditions in adolescents.

**Methods:** This study was approved by The Human Ethics Committee of the Federal University of Minas Gerais (protocol: 01936918.8.0000.5149). TMD was evaluated by RDC/TMD Axis I (muscle disorders, disc displacements, or joint disorders). General health and sociodemographic information were obtained through self-reported questionnaires answered by parents/caregivers and adolescents themselves. Also, a clinical exam was performed by two calibrated researchers for other oral conditions. Persons' Chi-square test, Mann Whitney, and Fisher's exact test was performed ( $p \leq 0,05$ ).

**Results:** Brazilian adolescents ( $n=90$ ) aged 13 to 18 years were included. Muscle disorders were presented in adolescents who always had a runny nose ( $p=0.003$ ); used medications ( $p=0.009$ ); had probable awake bruxism ( $p=0.014$ ) and lost teeth because of cavities ( $p=0.05$ ). Disc displacement (right side - RS) was associated with younger parents/caregivers ( $p=0.019$ ), frequent sore throat ( $p=0.032$ ) and previous dental trauma ( $p=0.002$ ). Joint disorders were associated with girls ( $p=0.028$  left side - LS); parents/caregivers lower educational level ( $p=0.046$  LS); less happiness ( $p=0.008$  LS), depression ( $p=0.016$  RS;  $p=0.002$  LS); probable sleep bruxism ( $p=0.003$  RS) and awake bruxism ( $p=0.007$  RS); decayed teeth ( $p=0.018$  RS;  $p=0.031$  LS); dental cavities prevalence ( $p=0.018$  LS); dental trauma ( $p=0.036$  RS) and dental wear ( $p=0.004$  RS).

**Conclusion:** Some sociodemographic factors, general health, and oral conditions are associated with specific TMD diagnostics.

### Dental Effects of Maternal Post-Partum Depression

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**Background:** Maternal mental health during Pregnancy, not only affects child's general health, but directly and indirectly has an effect on the dental health too. There is significant relation between preterm babies and delay in eruption of teeth. Depression during pregnancy is also associated with poor nutritional status, causing hypoplastic defects and also enamel calcification. Stressors during pregnancy affect neural tube formation and contribute to formation of cleft lip and palate. Breastfeeding difficulties and early cessation have been also seen.

**Review of literature:** L. Aine et al has concluded that children born preterm also have an increased frequency of enamel defects in the permanent dentition. W. Kim Seow concluded that overall VLBW children experienced a significant mean delay in dental maturation of approximately 3 months compared with NBW children, with the VLBW children below 6 years of age showing the greatest delay. Prokocimer et al concluded that preterm birth and LBW may predict hypomineralization in both primary and permanent dentitions. Zaidi I et al found that preterm children had less enamel thickness, increased roughness, pits on the surface. The prenatally formed enamel was 5 to 13 times the thickness of the enamel of full-term children, reflecting the shortened duration in the prenatal stage of enamel formation.

**Conclusion:** PPD definitely is associated with dental defects and should be considered as a differential diagnosis when Hypoplasia is investigated, in both dentitions. Identification and effective counselling can be effectively carried out by the dentists for better maternal and infant oral health.

**‘Calling all Health Visitors!’- Oral Health Promotion in the Under 5’s**

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**Background:** Health visitors are the first healthcare team to encounter families with new-borns and pre-school aged children in the community. Health visitors already provide oral health advice yet have infrequent training around this topic. This project aimed to evaluate and improve current oral health advice provided to children and families by health visitors covering three London boroughs; Lambeth, Southwark and Lewisham.

**Methods:** The oral health knowledge base of health visitors across these three areas was evaluated during a mandatory teaching session. Knowledge was assessed against the Delivering Better Oral Health national guidelines for prevention. Three questionnaires were formulated. Questionnaire 1 to establish baseline knowledge through seven short-answer questions. Questionnaire 2 completed after training to establish any improvement in knowledge. Questionnaire 3 determined learning needs and feedback. Sustainability of training was planned through recruiting a health visitor as a dedicated oral health champion.

**Results:** 22 health visitors attended the assessment and teaching session. 59% of health visitors were unsure of the maximum fluoride concentration for high caries risk children and half the staff were unsure of the most important time to brush a child’s teeth. A positive improvement was seen across all seven questions answered following the training.

**Conclusions:** Face-to-face teaching helped to improve health visitor’s knowledge of oral health advice for under 5’s. Health visitors showed interest in gaining additional resources for example guidance documents. Assigning an oral health champion amongst the health visiting team aided sustainability.

## The Use of Stainless Steel Crown in the Context of Minimal Interventional Dentistry for Treating Hypomineralized Molars

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**Introduction:** It is known that Molar-incisor hypomineralization (MIH) is a dynamic condition with an uncertain prognosis because the opacities can turn to enamel loss over time. There is a proposal for total removal of hypomineralized enamel, but this procedure is invasive and contrary to the philosophy of minimal interventional dentistry. One treatment option for these teeth is the stainless steel crown (SSC).

**Cases reports:** A 6-years-old boy was admitted to the pediatric dentistry clinic due to dental caries. The lesions where treated, however caries was not controlled, and the patient did not return to follow ups. The patient returned after 1 year, with a complaint of pain and tooth 26 had erupted with yellow-brownish demarcated opacities with loss of structure associated with caries lesion. The second case is a 7-years-old girl with complaint of hypersensitivity in the lower first permanent molar when eating hot/cold meals and toothbrushing. Clinical examination revealed opacities on occlusal and buccal surfaces with minor enamel loss. The tooth was already restored but the pain was not solved. The stainless-steel crown was used in both cases without any tooth preparation.

**Discussion:** On the first case, the choice of using SSC was due to the high risk of caries and the difficulty in adhering to follow-up appointments (restoration fails more frequently). In the second case the SSC was used to seal the opacities by covering them to solve pain sensitivity.

**Conclusion:** SSC when applied without tooth preparation is a good alternative for the treatment of MIH affected molars.

### **Association of Early Childhood Caries with Different Fluoride Levels in Southern Region of Rajasthan and Determination of its Risk Factors**

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**Background:** In India, Rajasthan is a state where almost all the districts are affected by high fluoride content. Significant gaps have been observed in the collective evidence on risk factors known to cause ECC and its association with high Fluoride levels. This study shows the prevalence and pattern of ECC in areas with mild, moderate and severe Fluoride concentrations in drinking water and it also determines the risk factors associated with ECC.

**Methods:** A cross-sectional study was carried out with 1200 children aged 0–6 years in three different villages of Rajasthan. Data analysis involved the use of the International Caries Detection and Assessment System (ICDAS) criteria. A questionnaire survey was conducted among the mothers of preschool children.

The drinking water samples of the selected villages were collected and the fluoride content of these samples was determined by fluoride ion selective method using colorimetric analyser and statistical analysis was done.

**Results:** The overall prevalence of ECC in Sarada, Semari and Thur villages of Rajasthan was found to be 69.41%. Highest prevalence was found in Thur(38.49%) followed by Sarada(37.06%) and Semari(16%) in accordance to the fluoride levels in drinking water 0.3, 2 and 1.5ppm respectively. Various risk factors like source of drinking water(61%), Snacks(100%), perinatal oral health care, parent's knowledge & attitude(35.13%) had shown significant results.

**Conclusions:** Prevalence of ECC was significant in the regions with moderate and severely fluoridated regions of Rajasthan (India). Various risk factors associated suggests need of awareness & regulation of fluoride at the optimum level.

## Temporomandibular Disorders are Associated with Sociodemographic Factors, Health-Related and Oral Conditions in Adolescents

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**Background:** Temporomandibular disorders (TMD) is a multifactorial complex condition. This cross-sectional study aimed to assess the association between TMD and socio-demographic factors, health-related factors, and oral conditions in adolescents.

**Methods:** This study was approved by The Human Ethics Committee of the Federal University of Minas Gerais (protocol: 01936918.8.0000.5149). The TMD diagnostic was obtained through the RDC/TMD Axis I. The diagnosis of chronic pain, depression and the presence of non-specific physical symptoms, including pain and generalized anxiety disorder, were obtained by the RDC/TMD Axis II. The feeling of happiness was measured using the Subjective Happiness Scale. Socio-economic and demographic characteristics and general health were assessed through self-reported or proxy questionnaires. Patients were examined clinically for other oral conditions. Data were submitted to descriptive statistics and binary logistic regression models ( $p \leq 0,05$ ).

**Results:** The TMD prevalence was found in the 90 adolescents (13 to 18 years old) to be 42%. TMD was associated with ethnicity ( $p = 0.040$ ), use of medications ( $p = 0.020$ ) and previous dental trauma ( $p=0.030$ ). Also, it tended to be associated with the presence of probable awake bruxism ( $p=0.053$ ).

**Conclusions:** Socio-demographic factors, health-related factors, and oral conditions play a role in TMD, with African-American adolescents, those who had used medications in the past year, and/or had previous dental trauma having a greater chance to present this disorder. Dentists should be able to identify adolescent patients with greater chances to present TMD, make an early diagnosis, and understand that TMD is related to factors that go far beyond oral conditions.

### Infant Oral Health Care: A Narrative Review

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**Background:** Infant oral health is an integral part of the general well-being of an infant. It is the foundation upon which a pediatric dentist can provide education and motivation regarding dental hygiene and preventive dental care which will contribute to a lifetime free of preventable dental diseases.

#### **Literature review:**

1. Ramos-Gomez (2009): Provides six step protocols for successful infant oral care visits.
2. Jawdekar. A.(2013): Proposes a model for infant and child oral health promotion in India combining age specific initiatives for health education, nutrition, hygiene and fluoride use.
3. Dhull. K. et al (2016): This article highlights important guidelines of infant oral health care which include risk assessment, preventive treatments, parental education, dental home and anticipatory guidance.
4. Voza.I.(2017): The aim of this survey was to evaluate knowledge and awareness of parents and caregivers about potential oral health risk factors for their children in their first months of life and concluded that there is a need for parental health promoting program emerged to control children oral health risk status.

**Conclusion:** This review concluded that the primary focus of infant oral health is prevention and every effort must be made to prevent and promote oral health not only by pediatric dentist but all health professionals.

Dental Materials, Infant Oral Health, Restorative Dentistry

## **Indirect Restoration and Conservative Approach for Molars with Molar-Incisor Hypomineralization: A Case Report**

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**Introduction:** Molar-Incisor Hypomineralization (MIH) is an enamel qualitative defect of systemic origin affecting first permanent molars and in some cases, permanent incisors. Due to the fragility, enamel can be fractured when subjected to mechanical forces. In these cases, the rehabilitation is a challenge.

**Case Report:** An 8-year-old female patient presented at the pediatric dental clinic due to caries lesions. Intraoral examination revealed the presence of MIH on all molars, with different degrees of severity. The treatment included different approaches according to the severity: minor enamel loss and caries lesions were restored with resin composite and teeth with high enamel loss were restored with conventional glass ionomer cement (GIC) using a simplified occlusal replica adapted technique. After obtaining maxillary and mandibular impressions, in the laboratory phase, a wax-up of the missing structure was performed. Then an addition silicone matrix of the wax-up was taken. In the clinical phase after acid conditioning, the matrix was filled with GIC, positioned on each tooth, and pressed for the GIC setting time.

**Discussion:** There is no evidence of the best strategy for MIH affected molars rehabilitation. The proposed technique with no tooth preparation and use of GIC is specially indicated for patients with newly erupted MIH severely affected molars, diminishing the risk of pulp exposure.

**Conclusion:** The present report showed that treatment planning might consider the characteristic of each tooth. In addition, the proposed technique may be an advantageous option for MIH affected molars, since it is able to accurately reproduce the occlusal anatomy through an agile and comfortable procedure.



### Unstimulated Salivary Collection in Children: Pilot Study

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**Background:** Unstimulated saliva is composed by biomolecules from different systemic sources and it is known to potentially reflect body homeostasis. It constitutes a valuable source of clinical information in the context of systemic and oral diseases, with its collection being simple, safe and non-invasive compared to other biofluids. Despite the recognized diagnostic utility in children, its collection is often a challenging procedure. The authors intend to illustrate unstimulated saliva collection methods in children, highlighting their potential advantages and disadvantages and performing a concurrent assessment of volume and pH.

**Methods:** 19 samples of unstimulated saliva were collected from 4-year-old children by passive drooling, collection with Saliva Collection Aid® tube (Salimetrics, State College, PA, United States of America [USA]), absorbent devices Salivette® (Sarstedt, Newton, NC, USA) and SalivaBio`s Children`s Swab® (Salimetrics, State College, PA, USA). Samples` volume and pH were pH determined using the Saliva-Check Buffer kit (GC America, Inc., Alsip, IL, USA).

**Results:** Passive salivation allowed collecting a higher salivary volume, although not all participants cooperated. SalivaBio`s Children`s Swab® allowed larger volumes samples than those obtained with Salivette®. Overall, absorbent devices seemed to provide some advantages regarding children`s cooperation. pH values were identical between samples, with a slight acidic tendency for those collected with Salivette®.

**Conclusions:** Comparative studies of collection methods are scarce, and those allowing valid, reliable and reproducible methodological option are desirable. Of the available devices, "absorbents" seem to provide some advantages, yet their suitability for emerging analytical technologies remains to be assessed.

**Parents` Knowledge about MIH and its Treatment Possibilities: Preliminary Findings**

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**Background:** The possibilities for treating teeth with molar-incisor hypomineralization (MIH) are diverse and the decision regarding the best approach should be made individually, considering the age of the patient and the severity of the condition, as well as the expectations of the child and parents. This study assessed the parents` knowledge and perception regarding MIH and its treatment possibilities.

**Methods:** A total of 34 parents of children evaluated at the pediatric dentistry clinic participated in the study. Initially, the REALMD-20 health literacy test was applied, and then the parents answered the questionnaire about MIH. Next, the parents watched an explanatory video about MIH and its treatment alternatives to answer the knowledge questionnaire again. At the same time, another questionnaire with clinical cases of MIH at different severities was applied to choose the treatments that they considered the best option.

**Results:** The results showed that health literacy did not impact the total number of correct answers in the knowledge questionnaire or the treatment ( $p=0,050$ ). Regarding knowledge about MIH, parents got more questions correct after watching an explanatory video ( $p=0,001$ ). However, there was no correlation with greater accuracy in questions related to the treatment of anterior (75%) and posterior teeth (39%).

**Conclusion:** It is concluded that the parents initially had little understanding regarding MIH. After receiving information, they were relatively able to absorb the knowledge and distinguish the difference between possible treatments according to severity observed.

**Perception of Adolescent Pregnant Women about Baby Oral Health**

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**Background:** The primary care policy of SUS (Unified Health System) offers care directed to most vulnerable population groups, especially to pregnant teenagers. Dental guidelines should be included in the prenatal period, since women are p more receptive to acquiring new knowledge at this time. Access to dental care during pregnancy is fraught with barriers, ranging from the low perceived need of pregnant women, anxiety and fear of feeling pain, and difficulties in entering the public health service. This study evaluated the knowledge of pregnant teenagers about oral health and future oral baby care.

**Methods:** This quantitative study, involving pregnant women aged 13 to 18 years old, attending a referral unit for adolescent health in Belém-PA. Data were collected through a questionnaire and tabulated for further statistical analysis.

**Results:** 75% of pregnant women reported not having access to dental prenatal care, 28.57% said that breast milk is important as food, and 51.79% of them believe that it does not cause caries. 87.50% of them believe it is important to clean the baby`s mouth after each feeding and 35% affirm that the baby`s first consultation should be when the first tooth is born.

**Conclusions:** There was a deficiency in the knowledge of pregnant adolescents regarding their oral health and future baby oral care, showing the need for educational actions aimed at this group.

### Modern Approaches to Teething

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**Background:** Eruption of primary teeth is a significant developmental marker for infants. The signs and symptoms in this physiological process may be related to teething or associated with different diseases and conditions.

**Literature Review:** This presentation aims to describe the signs and symptoms frequently attributed to teething and management of teething problems with non-pharmacological and pharmacological methods. The teething symptoms are pain, gingival swelling, irritation, redness of the gum, thumb sucking, circumoral rash, gum rubbing, crying, increased salivation, drooling, increased biting and loss of appetite. Diarrhea, fever, vomiting, ear pain, rhinorrhea and weight loss may be misinterpreted and unrelated symptoms in teething. The teething problems can be managed by pharmacological and non-pharmacological methods. Non-pharmacological methods include some approaches such as cooling or rubbing the teething site. Pharmacological methods for teething generally include to achieve analgesia, anaesthesia, sedation or a combination of these. Lignocaine choline salicylate and paracetamol -based products are available when other therapies fail to provide relief in teething process.

**Conclusions:** Several complementary and alternative medicines have been suggested for managing teething pain. The efficacy of these agents against teething pain is still under discussion and some problems may occur in combination therapies with conventional analgesics. The risks and adverse effects associated with inappropriate or prolonged use of pharmacological agents may outweigh their supposed benefits. The knowledge and practices of parents and health professionals related to infant teething must be improved with continuing educational programs.

**LTF rs1126478 Genetic Variant association with Dental Caries according to ICDAS Criteria in Brazilian Preschool Children**

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**Background:** Lactotransferrin (LTF) is a salivary glycoprotein which interacts with dental biofilm and may interfere in caries development. This study aimed to evaluate the influence of LTF gene variation rs1126478 on dental caries susceptibility in preschool children aged three to six years old.

**Methods:** This case-control study performed oral examination in 448 Brazilian preschool children attended in an Oral Health Program. Subjects were evaluated according to International Caries Detection and Assessment System (ICDAS) criteria. Samples of unstimulated saliva were collected and LTF variant rs1126478 from oral mucosa cells' DNA were analyzed by Polymerase Chain Reaction (PCR) followed by Restriction Fragment Length Polymorphism (RFLP) using Ear-I enzyme restriction.

**Results:** The subjects were divided in caries-free group (ICDAS-0, n=48), white-spot group (ICDAS 1-2, n= 248) and enamel and dentin caries group (ICDAS 3-6, n=152). Multinomial logistic regression model adjusted for confounding factors was performed and AG genotype children were less likely to have enamel and dentin caries when compared to AA genotype (OR = 0.42, CI95% = 0.18–0.95, P = 0.038) and AA+GG (OR= 0.43; IC95%= 0.21–0.87; P= 0.020). Other tested models had no significant influence on caries development. To the best of our knowledge, this is the first study to show the influence of LTF genetic variation rs1126478 on caries development according to ICDAS criteria.

**Conclusions:** LTF rs1126478 AG genotype was associated with reduction of caries development in Brazilian preschool children.

**Decrease in Caries Risk in Children's Patient with CIT-S Sequels: Case Report**

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**Introduction:** Severe caries of the early childhood is considered as a dysbiosis caused by the consumption of sugars. This disease has serious repercussions on the general health of the child, such as: severe pain, facial infections, hospitalizations, emergency visits, decreased physical development and learning ability. Likewise, a child with cavities in the primary teeth will probably be an adult with oral problems.

**Case report:** A 7-year-old male patient consults for not having teeth. height 112 cm and weight 18kg. Without important pathological antecedents. Clinically it was observed: dental loss of 75.9%, generalized gingivitis, profusion eruption of the first molars, multiple caries, radicular remains in 13 teeth with chronic apical. The preventive treatment consisted of diet analysis, mechanical biofilm control and motivation through positive reinforcements. The restorative treatment was carried out through surgery, pulp therapy, tooth extraction and preventive orthodontics.

**Discussion:** The control of the etiological factors improved the oral environment for the eruption of the permanent teeth, thanks to the motor ability developed in the patient, also the motivation applied in the patient achieved a positive attitude towards the importance of dental care having an impact positive in the quality of life in your future.

**Conclusion:** The implementation of strategies of prevention, motivation and limitation of damage, proposed in this work, managed to reduce the high risk of caries in the child patient with severe dental loss.

**Oral Findings in a Child with Niemann-Pick Disease Type B: A Case Report**

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**Introduction:** Acid sphingomyelinase deficiency (ASMD), a rare lysosomal storage disorder, is an autosomal recessive genetic disorder caused by mutations in the SMPD1 gene. Patients with ASMD are classified as having Niemann-Pick disease (NPD). The aim of this study is to report a case of a child diagnosed with NPD type B and to describe the oral findings.

**Case report:** A 7-year-old male child with NPD type B attended at Pediatric Clinic of Dental School, Federal University of Ceará, Brazil, requiring dental treatment. Parents reported that they were previously instructed by medical assistance to be careful about diet, excluding fatty and fried foods. As the patient also presented respiratory impairment, with a history of frequent infections, rigorous physical activity was contraindicated. The physical examination revealed an increased abdominal volume, indicative of hepatosplenomegaly, besides delayed growth. The intraoral examination showed several primary teeth with white spot and cavitated lesions, probably due to a poor oral hygiene associated with a fermentable carbohydrate-rich diet. In the first molar permanents, it was also observed white/yellow opacities suggesting a molar-incisor hypomineralization. A panoramic radiograph was performed and a plan treatment was proposed.

**Discussion:** From a medical point of view, many studies have addressed NPD, however few reports highlight the oral characteristics as well as dental treatment proposed. Patients with hepatic dysfunction require caution during drug prescribing, since liver is the main organ of drug metabolism.

**Conclusion:** Dentists must be aware of clinical features of NPD and provide preventive instructions to control dental caries in these patients.

**Probiotics on the Occurrence of Nutrition Absorption Capacities in Healthy Children**

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**Background:** Dietary nutrients have critical importance to the microbioma balance in the gastrointestinal tract.

Therefore, the alteration of microbiota in order to achieve, restore and maintain favorable balance in the ecosystem and the activity of microorganisms present in the gastrointestinal tract is necessary for the improved health condition of the host. This poster is to evaluate, efficacy and safety of prophylactic probiotics for better nutritional absorption capacity in the view to enhance their overall health and immunity.

**Literature review:** Ballini et al. conducted a study to evaluate the effect of probiotics on occurrence of nutrition absorption capacities in healthy children: a randomised double-blinded placebo- controlled pilot study and concluded that the probiotics may be suggested as supplements to improve biomarkers serum concentration if administered for a period of at least 5 weeks.

**Conclusion:** Prophylactic probiotic intervention with a selected strain combination, should be a useful tool for pediatric population for improving biochemical parameters serum concentration.



### **The Beginning of a Future Without Fear of Dentists: Efficiency of a Needle-free Anesthesia in Pediatric Dentistry, a Randomized Clinical Study**

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**Background:** Local anesthesia, for dental procedures is usually performed by injection. To reduce fear, a polymeric anesthetic device was developed. The goal of this study was to compare the efficiency of this non-invasive polymeric anesthetic device (PD) with conventional local anesthesia (CA).

**Methods:** Fifty children within four to twelve years of age participated, all who needed similar procedures in two homologous teeth and maxillary contralateral teeth. Procedures included sealants, restorations and extractions of deciduous teeth. An evaluation of the heart rate per minute (bpm) was made and blood pressure was measured, both before and after anesthesia. Each child was submitted to two anesthetic techniques (AT) – CA and PD, within a weekly break. During the AT, the behavior was evaluated through a form. After the AT, the child indicated the level of pain using the Wong-Baker Faces Scale and after both AT, the child reported on the preferred procedure.

**Results:** The results were presented as a percentage or compared using the Chi-square and Wilcoxon tests ( $p=0.05$ ). Regarding systolic and diastolic blood pressure, no significant differences were observed between AT; with regard to bpm, it was observed that they were increased in CA, both before and after AT ( $p=0.015$  and  $p=0.042$ , respectively). It was observed a difference in the children's behavior with the use of PD ( $p=0.0028$ ). In the evaluation of the faces scale, 74% elected the painless faces ( $p=0.00010$ ) with PD, and 86% elected PD as the preferred technique.

**Conclusions:** The PD was effective, and in addition also reduced children's fear.

### Infant Oral Health Care in Covid-19 Scenario

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**Background:** Perinatal and infant oral health are the foundations on which preventive education and dental care must be built to intensify the opportunity for a child to have a lifetime free from preventable oral disease. During pandemic scenarios like COVID-19, the oral health care of infants should not be compromised due to lack of knowledge or due to any fear of approach towards the dentist. Proper knowledge about the disease in infants will help to educate the parents regarding infant oral health.

**Literature Review:** Knight et al stated that Covid-19 is a respiratory infection, the neonatal immune system may have provided protection against the 'cytokine storm' experienced by adults and concluded that the incidence in the neonatal population remains low.

WHO states that there has been no confirmed mother-to-child transmission of Covid -19 but this is still unclear.

According to Velasco-Aro & Sanchez- Mostiero there is no evidence of presence of the virus in breastmilk of Covid-19 mothers and they can continue to breastfeed using strict hand hygiene and droplet precautions.

WHO stated in 2020 that Covid-19 mothers and their babies should not be separated, and skin-to-skin contact is encouraged. It also concluded that the initiation and continuation of breastfeeding is safe for all mothers with suspected or confirmed Covid-19.

**Conclusions:** The research related to infant Covid-19 infection are limited and unclear, and most of the literatures are vague and contradictory. Therefore, more research must be carried out for better understanding of the disease in infants.

### In the Dark about Teething Pills?

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**Background:** Teething in infants remains one of the major concerns of mothers due to complication such as diarrhea, fever, increased salivation or drooling, runny nose, and loss of appetite. Homeopathic medicines are known to be useful for paediatric diarrhea in studies conducted in India and other parts of the world.

**Literature review:** The period associated with eruption of primary (deciduous) teeth in infants can be difficult and distressing for both child and parents, as this is often accompanied by minor signs/ symptoms such as increased salivation, drooling, running nose, mild fever, loss of appetite, diarrhea, circum-oral rash, facial flushing, general irritability, sleep disturbance, crying, fussiness, ear rubbing on the side of the erupting tooth, intra-oral ulcers, inflammation of gingiva overlying the tooth, gum irritation and increased biting tendency. It is evident that there is concurrence of diarrhea, low-grade fever and runny nose in children, during the age of primary teething. Calcarea phosphoricum 6X, Ferrum phosphoricum 3X, Magnesium phosphoricum 6X, Belladonna 30C, Chamomilla 30C and Podophyllum 30C are found to be useful in reducing the symptoms.

**Conclusion:** An approach with regular use home-based care with homeopathy through health workers for common problems in teething children is acceptable to the community and enhances outreach of services to the public at large. Considering the relative advantages identified, a controlled study on effectiveness of homeopathy in promoting healthy primary teething and its possible role in reducing incidence of diarrhea and URTI (upper respiratory tract infection) in children is envisaged.

**Saliva: An Important Alternative for Tracing and Diagnosing COVID-19 in Children**

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**Background:** The increasing number of cases of COVID-19 across the world poses challenges to healthcare systems not only in effectively identifying individuals positive for SARS-CoV-2, but also in isolating cases to minimize contamination and in early diagnosing cases for hospitalization. In view of this scenario, the objective of this study was to present saliva as an alternative for seeking diagnostic and prognostic markers of COVID-19 in children, including adequate collection techniques for different age groups in this population.

**Literature Review:** Less-invasive collection methods are indispensable in a pandemic scenario as large-scale tests are necessary to understand the actual evolution of transmission in different populations, thus making it possible to make decisions based on scientific evidence. Saliva has been shown to be an alternative for diagnosing viral infections as this fluid can be easily and quickly collected without using specific devices and causing less discomfort during collection, which is an important factor for use in children population. Despite the smaller percentage of severe cases of COVID-19, children seem to play an important role in the transmission as they have the same potential of transmission as that of adults. Knowing the evolution of the COVID-19 pandemic in children is extremely important, mainly regarding flexibility in terms of social distancing, such as school re-opening and recreational activities. In addition, countless cases of Kawasaki syndrome have been recently related to SARS-CoV-2 infection.

**Conclusions:** Therefore, saliva can be an important alternative for tracing and diagnosing COVID-19 in children.

### **Do Children and Parents Agree on the Presence and Intensity of Dental Pain?**

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**Background:** Self-report is little used in the assessment of dental pain in preschoolers. The aim of this study was to evaluate the dental pain of children from self-report and from the parents` report and to measure the agreement between these respondents.

**Methods:** This study was conducted with 166 children aged 4 to 6 years with untreated caries and their parents. Participants answered a question about the presence of dental pain of the child at that time. For cases where there was pain, the Simplified Faces Pain Scale (S-SPF) was presented and it was requested that the face that best represented the intensity of dental pain be pointed out. The data were analyzed descriptively and using the weighted Kappa and Kappa tests (separately for each age group - 4, 5 and 6 years).

**Results:** Dental pain was reported by 38.6% of children and 28.9% of parents. The "severe" intensity was the most frequent in the parents` report (45.8%). Most children with pain reported mild intensity (34.4%). The agreement about the presence of dental pain was moderate (4 years Kappa 0.57; 5 years 0.60; 6 years 0.43). The agreement about the pain intensity of 4-year-old children (weighted Kappa 0.40) and moderate for those aged 5 (0.41) and 6 (0.42) years.

**Conclusions:** Children and their parents moderately agree on the presence and intensity of dental pain. It is possible to assess children`s dental pain using the self-report and add to the proxy measure when necessary.

**Child Abuse and the Role of the Pediatric Dentist: Orofacial Aspects, Identification and Reporting**

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Rafael Pedro

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**Background:** Child abuse is a growing phenomenon in the world which annually affects thousands of children and adolescents, their families and their communities. It is recognized by the World Health Organization (WHO) as a public health issue. Child abuse can be divided into physical, sexual, psychological and violence of deprivation or neglect. The aim of this study was to discuss the types of child abuse, their orofacial aspects, identification and reporting, as well as to help the pediatric dentist (PD) be aware of this public health problem.

**Literature review:** A research was made using the MEDLINE, SciELO and LILACs databases. It was found that the most affected areas with the highest prevalence of injuries were to the head and neck region. The injuries commonly found are: hematomas and bruises, nasal fractures, dental traumas, lacerations, burns, abrasions or bruising, labial or lingual frenum tears, ecchymosis or lacerations of the gingiva, tongue, palate, or floor of the mouth, traumatic injuries at different stages of healing, bitemarks, petechiae on the palate of unexplained origin and sexually transmitted infections.

**Conclusions:** Pediatric dentists may be the first professionals to assist children who are victims of abuse, since most physical aggressions occur in the head and neck region. To do this, they must be able to identify the cases and report them to the competent bodies to help victims in such situations, thus stopping violent acts.

**Tethered Oral Tissues and Nursing: A Review of Literature**

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**Background:** Pediatric dentists treating infants present with symptoms of tethered oral tissues can see a clinical improvements of symptoms in most of infants and mothers.

**Literature Review:** Tethered oral tissues can include ties of the tongue, lip, and buccal tissues. This is when the frenula are short and/or thick and restrict the movement of tongue, lips, cheeks. Between 4-10% of newborns were diagnosed in 2005 with tethered tissue, and in 2014, diagnoses had grown to 20%. Babies who have one/ more of these oral anomalies show symptoms of poor, difficult latch/ popping off frequently when breastfeeding; gumming/ chewing while nursing; or gasping for air, clicking/ wheezy sounds while nursing; or excessive drooling. This leads to excessive air swallowing during feedings, causing hiccups and gassiness, which can in turn cause colic and reflux issues. As the baby ages, more problems associated with these oral anomalies present themselves. As the baby begins to develop teeth, lack of movement can lead to increased caries risk due to being unable to clear the mouth of milk and food debris. This review of literature analyses the tethered oral tissues and difficulties related to that in infants and their mothers.

**Conclusions:** This literature analysis shows that tethered oral tissue is an important problems. If not well treated it can create problems not only related to feeding and speech, but also growth and posture. Since it is present in a relevant number of newborns, it should be diagnosed earlier to be cured on time.

# ***Oral Medicine and Pathology***



**Diagnosis and Treatment of Oral Pyogenic Granuloma in a Pediatric Patient of Definitely Negative Behavior**

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**Introduction:** Pyogenic granuloma (PG) is one of the most common reactive hyperplasia in the oral cavity, associated with some irritating local factor (minor trauma, infectious focus, poor oral hygiene). Definitive diagnosis is based on pathological study. Standard treatment of PG is surgical excision and removal of the irritating factor. The purpose of the report is to show the management of oral pyogenic granuloma in a pediatric patient with definitely negative behavior.

**Case report:** A 5-year-old male patient with a history of pain during chewing associated with bleeding. Intraoral clinical examination revealed poor oral hygiene, multiple root fragments, and a hemorrhagic hyperplastic lesion of 2 x 2.5 cm on the gum of piece 75 which had pulp necrosis. Electrosurgical removal of the lesion and piece 75 tooth extraction were performed under general anesthesia, due to definitely negative behavior of patient (Frankl scale 1). Anatomical pathology analysis reported a lobular capillary hemangioma.

**Discussion:** In comparison to lasers, electrosurgical removal is faster, more accessible, less expensive and provides similar or better hemostasis; however, it is less precise. The American Academy of Pediatric Dentistry (AAPD) recommends the use of general anesthesia in patients who are extremely uncooperative or require significant surgical procedures, two criteria present in the case report.

**Conclusion:** It is important to consider oral pyogenic granuloma among pediatric buccal lesions, and furthermore corroborate the diagnosis with the anatomical pathology study. Electrosurgery under general anesthesia is confirmed as a safe treatment for pediatric patients with definitely negative behavior.

**Accessory Canals and Dentin Permeability in the Furcation of First Primary Molars**

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**Background:** Furcational lesions has been associated with different causes over time, including complex morphology of deciduous teeth, presence of accessory canals, and the greater dentin permeability. The purpose of this study was to evaluate the relationship between the presence and diameter of accessory canals with the permeability of dentin at the furcational level in the first primary molars.

**Methods:** An in vitro study was carried out in 39 first primary molars. The molars were evaluated initially with a digital microscope after coloring and in a second phase to correlate the data between decalcification with digital microscopy and histological sections.

**Results:** The findings from 135 accessory canals showed that the most prevalent shapes were oval (73%), round (17.7%) and irregular (9.2%). It also was observed that the mandibular molars showed a greater number of accessory canals compared to the maxillary molars; however, the maxillary molars showed a greater average in the diameter 75.55  $\mu\text{m}$  (SD 106.64  $\mu\text{m}$ ).

**Conclusion:** The relationship between the presence and quantity of accessory canals in the maxillary and mandibular first primary molars can generate greater dentine permeability at the furcational level.

### **Sports Mouthguards in Children: Bacterial Contamination Pattern, Surface Roughness and Chlorhexidine Spray used as a Disinfection Method**

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**Background:** An active lifestyle has become essential in people's daily lives, regardless of age, and playing sports is a part of this general health pattern. However, these activities can be considered a risk factor for the occurrence of traumatic injuries, thus, the use of sports mouthguards has been recommended preventively. The correct hygiene of these devices are necessary to offer longevity of mouthguards. The aim of this study was to evaluate, microbial contamination of sports mouthguards, surface roughness, and the efficacy of chlorhexidine gluconate spray in the disinfection protocol.

**Methods:** Twenty children who practiced martial arts, were instructed to wear sports mouthguards 3 days a week and after use, spray sterile tap water (control group) or 0.12% chlorhexidine (experimental group). After 2 weeks, the devices were analyzed by MTT assay, Checkerboard DNA-DNA hybridization, and confocal laser microscopy.

**Results:** Mouthguards of the control group were more contaminated with cariogenic microorganisms than those of the chlorhexidine group ( $p = 0.005$ ). Decreased bacterial cell viability was observed in the chlorhexidine group, thus emphasizing its cytotoxic effect on microorganisms ( $p = 0.0007$ ). A difference in the surface roughness of the protectors was detected, as demonstrated by the increase in the final roughness when compared to the initial roughness. A moderate correlation ( $r = 0.59$ ) was observed between surface roughness and the number of cariogenic microorganisms in the control group.

**Conclusion:** Sports mouthguards had intense bacterial contamination and increased surface roughness after its use, and 0.12% chlorhexidine spray was effective in reducing this contamination.

**Langerhans Cell Histiocytosis Case Report and Systematic Review**

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**Introduction:** Langerhans cell Histiocytosis (LCH) is a rare idiopathic disease characterized by the aggressive clonal proliferation of dendritic Langerhans derived from the bone marrow that create osteolytic lesions and where oral manifestations are usually present. The aim of this report is to present a 5 year follow up of case diagnosed in 2014 and a systematic review of oral manifestations of LCH.

**Case Report:** On 2014 a 3-year-old male patient was referred to the pediatric dentistry residency clinic at the University of Puerto Rico, School of Dental Medicine by his private dentist to evaluate possible periodontal disease on the primary second lower molars. Radiologic examination revealed bilateral bone loss with the developing floating tooth bud of the first permanent left molar. After clinical evaluation of the patient, an excisional biopsy and curettage of the involved area was performed. Pathological report confirmed LCH diagnosis. Due to pathological findings, the patient was referred to a pediatric oncologist for a follow-up consultation and further treatment. Follow-up over 3 months revealed healthy soft tissues with normal color. Affected bone areas show to be healing properly.

**Discussion:** Da Fonseca, et al. (2017). At 3 y/o swelling and osteolytic lesion on R/L side of the mandible. This case report was the original case on which our 5 year follow up was based upon. At 4 and 5 y/o follow ups findings within normal limits. At 6 y/o lesions observed in #L area which required second surgical intervention and at 7 and 8 y/o follow up findings within normal limits.

In summary, the most common manifestations reported were; inflammation in two of the four articles discussed, redness in two of the four articles discussed and bone loss in the affected areas in the four articles discussed.

**Conclusion:** Langerhans oral manifestations were in articles discussed in the systematic review and in our case report was swelling, redness and bone loss on affected areas. Due to the recurrence rate of this disease on 2 of the 4 case reports with follow ups presented affected areas, thus the importance of follow ups in the pediatric population. Follow-up times vary between articles reviewed. Three of the four articles reported recurrence of osteolytic lesions in the jaw. There are no recurrence rates reported in the literature as this depends on a variety of factors. The most important factor is how the patient responds to different available treatments.

**Unusual Presentation of Extravasation Cyst of the Buccal Mucosa in a Young Child**

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**Introduction:** Mucoceles are common cystic lesions of the oral mucosa. Extravasation mucoceles are mainly found in the lower lip of young patients. Mucocele has clinical resemblance with other swellings and ulcerative lesions of oral cavity and hence needs to be differentiated carefully. We report an interesting unusual case of mucocele of left buccal mucosa which presents as fluctuant swelling and presented as a hard, fluctuating swelling in a child of age 7 years.

**Case report:** A 7 year-old child reported with a chief complaint of swelling in the left cheek region. Intraorally, it was solitary, round swelling of 1.5cm in diameter. On palpation it was tender. Ultrasonography suggested a well-defined Iso- Hypoechoic lesion at the corner of the mouth on left side. Confirming with the above investigations, surgical excision of lesion was done and the collected specimen sent for the histopathological examination. Reports suggested it to be Mucocele.

**Discussion:** Mucoceles are mucus containing cystic lesions of the minor salivary glands. Although, they can be found in any region where there are salivary glands, but rarely in the palate, retromolar space and the buccal mucosa. Crucial etiological factors are trauma, obstruction of salivary gland duct. Physical trauma causes a spillage of salivary secretion into surrounding submucosal tissue. Habit of lip biting, tongue thrusting also one of the aggravating factors.

**Conclusion:** Management of mucocele becomes challenging because of their high chances of recurrence. However, surgical excision with dissection of surrounding and contributing minor salivary glands proved to be successful with least recurrence.

**Oral Myofibroma in Children: Report of Three Cases**

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**Introduction:** Myofibroma is a rare spindle cell neoplasm of myofibroblastic origin. This lesion predominantly involves in the head and neck region, but the incident of myofibroma in the oral cavity is low. We aim to report 2 cases of gingival myofibroma and 1 case of palatal myofibroma.

**Case report:** Three cases of oral myofibroma were reported, 2 occurring on the gingiva and 1 on the palate. The children affected were between 8 and 16 years of age. Of the 3 reported cases, 2 were males and 1 female. The differential diagnosis for these cases were peripheral giant cell granuloma, pyogenic granuloma and fibroblastic granuloma. All were treated by surgical excision and curettage under general anaesthesia. Histopathology revealed proliferation of spindle cells in bundle, whorls and short fascicles arrangement with numerous capillaries. Observed scattered hemangiopericytoma-like blood vessels in one of these cases. Immunohistochemical studies show that the spindle cells were positive for smooth muscle actin (SMA) but negative for desmin and S100 protein. Thus, these lesions were interpreted as myofibroma.

**Discussion:** Diagnosis of myofibroma can be challenging and the treatment is controversial. The literature review did not reveal any gold standard treatment for this oral lesion. However, complete local excision was the treatment of choice.

**Conclusion:** Oral myofibroma usually appears to be a malignant lesion due to the rapid enlargement. Biopsy is compulsory for establishing definitive diagnosis and treatment.

**Congenital Atresia of the Submandibular Gland Duct: Report of Two Clinical Cases and Literature Review**

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**Introduction:** Congenital atresia of the submandibular gland duct is a rare condition, originated during the embryogenic process, characterized by swelling in the region of the oral floor.

**Case report:** In the present study reports two cases of babies with anomaly diagnosed as congenital atresia of the submandibular gland duct, with clinical findings demonstrating swelling, well-defined in the region of the oral floor, slightly translucent bluish color, painless to palpation, without finding stones or salivary drainage and apparently with no perforation of the submandibular gland duct. Both were submitted to prosthodontics, later presenting spontaneous regression without the need for surgical intervention.

**Discussion:** In a literature review, only 31 published cases were found. The age in the reports ranged from 12 hours to 1 year and 10 months, in agreement with the age group of the present study. In most cases, the lesion affected the left side of the oral floor (13 cases) and the most common diagnostic method was based on a thorough clinical examination (14 cases). Regarding the form of treatment, most cases were treated with incision and / or marsupialization, with only one case of spontaneous regression.

**Conclusion:** This study highlights the importance of conducting a thorough clinical examination in addition to showing that the use of complete examinations may not be essential, reinforcing the importance of preservation when there is no harm to the patient, especially in the case of babies.

**Minimally Invasive Laser Assisted Excision of Pyogenic Granuloma**

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**Introduction:** Pyogenic granuloma (PG) is a type of inflammatory hyperplasia seen in the oral cavity. It is a reactional response to minor trauma or chronic irritation. Also, Various treatment techniques have been described for the management of PG. However, the most common treatment advised for PG is surgical excision. Alternative approaches such as laser-assisted excision have also been recommended, especially for pediatric patients.

**Case report:** A 5-year-old male patient reported with a chief complaint of a lesion on the gingiva of left lower primary second molar for past one month. On clinical examination, a solitary sessile, exophytic mass, red in color, and soft in consistency, about 3×1cm in diameter, was observed. The lesion appeared lobulated with a smooth surface and bled on palpation. A provisional diagnosis of pyogenic granuloma was given. Excision was done using diode laser and sent for histopathological examination, which suggested a definitive diagnosis as pyogenic granuloma.

**Discussion:** PG is formed in response to various stimuli such as chronic low-grade local irritation, traumatic injuries, and certain kinds of drugs. Conservative surgical excision and elimination of causative irritant is the usual treatment. The advantages of laser therapy include minimal postoperative pain, time-saving, avoidance of the need for sutures, and is well tolerated by pediatric patients, thereby reducing fear of treatment.

**Conclusion:** The use of laser as modern medicine offers a new tool for treatment for soft tissue surgeries such as removal of pyogenic granuloma would lessen stress and fear of pediatric patients.



**Impact of Cigarette Smoke on Osteogenic and Osteoclast Signaling in Middle Palatal Suture**

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**Background:** Smoking is a public health problem that has been growing among adolescents. The aim of this study was to investigate the impact of cigarette smoke on osteogenic and osteoclastogenic signaling in middle palatal suture of rats.

**Methods:** Male Wistar rats, 6 weeks old, exposed (n = 30) or not to cigarette smoke (n = 30) were used. Exposure to smoke was carried out for two daily periods of 3 minutes each, with an interval of 12 hours between exposures, in a transparent container. After the experimental periods of 3, 7, 14 and 21 days, the animals were euthanized. The collected tissues were analyzed using light microscopy and real-time RT-PCR to investigate gene expression. The data obtained were compared using the Kruskal Wallis and Dunn tests ( $\alpha = 5\%$ ).

**Results:** Morphologically, there were no significant changes in the middle palatal suture of rats exposed or not to cigarette smoke during 3, 7, 14 and 21 days (p 0.05). On the other hand, osteoclastogenic signaling was increased in animals exposed to smoke and was characterized by a higher production of RANKL at 3 and 14 days (p 0.05), with no change in synthesis of RANK and osteoprotegerin (p 0.05). In the exposed animals, an early increase synthesis of osteocalcin, bone sialoprotein and osteopontin was also identified at 3 days of exposure (p 0.05), not sustained over time (p 0.05).

**Conclusions:** Cigarette smoke modulates osteogenic and osteoclastogenic signaling in middle palatal suture of young rats, although morphological changes have not been evidenced.

### Which Pathological Oral Findings are Associated with COVID-19? A Brief Review of the Literature

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**Background:** The Coronavirus Disease 2019 (COVID-19) spreads rapidly and the oral mucosa has been implicated as a potential route for SARS-CoV-2 entry due to the high expression of angiotensin-converting enzyme (ACE2) receptors in the oral epithelial cells. It has been reported that infected patients can present symptoms and clinical signs in the oral cavity that can be seen in the early stages of the disease. Also, oral findings may be associated with cutaneous manifestations, haematological and immunological systemic changes resulting from the disease. This study aimed to review the literature regarding whether oral findings are associated with COVID-19.

**Methods:** Electronic searches were performed on MEDLINE and the Google Scholar databases.

**Results:** Aphthous lesions; blisters; candidoses; dry mouth; enanthema; erythematous macula; stomatitis; thrombocytopenic purpuras; and ulcer similar to herpetic lesions were reported.

**Conclusion:** Systemic manifestations and drugs intake have been related to the evolution of the disease and could lead to adverse clinical oral signs and symptoms with changes suggestive of COVID-19 disease. Further studies are needed to evaluate whether these findings are associated with the SARS-CoV-2, opportunistic diseases, the drug intake, any other health conditions or a combination of factors. Besides, intraoral examination of the mucosa is of paramount importance, especially for patients with suspected COVID-19.

**Excision of Irritation Fibroma in a Paediatric Patient using Diode Laser: A Case Report**

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**Introduction:** Irritation fibroma is a reactive hyperplasia of dense connective tissue in response to local trauma. Complete excision is the preferred treatment. In this case report, child friendly conservative approach using dental laser is preferred over conventional approach as it is more rewarding for paediatric patients and they aid in behaviour management resulting in better patient compliance.

**Case Report:** A 11-year-old, male child, reported to department of paediatric and preventive dentistry, complaining of globular enlargement on left lateral side of tongue since 3 months associated with difficulty in speech and mastication. No pain, no trauma, no habits and no relevant medical history. Lesion was pinkish, solitary, oval, firm, soft, sessile, non tender, non-ulcerated, initially small, later progressed to size 9mm x 10mm. Blood investigations were normal. Excisional biopsy using diode laser was performed (Biolase, USA, 940 nm, 2 Watt, tip 300 microns diameter, continuous mode) under local anaesthesia. Excised tissue was sent for histopathological examination. Patient was comfortable with no bleeding and no sutures needed. Patient was instructed to take analgesics if needed. Histopathology confirmed provisional diagnosis of irritation fibroma. There was uneventful healing with no scars at 14 days recall visit. At 6 months recall, no recurrence was noticed.

**Discussion:** Advantages of lasers include minimal local anaesthesia, minimal bleeding, enhanced visibility, time saving, minimal scarring, reduced postoperative pain and discomfort, excellent healing, no recurrence, all this adding to better patient and parent acceptance.

**Conclusion:** Complete excision of irritation fibroma using diode laser has shown promising results.

### Managing a Dentigerous Cyst in the Developing Dentition

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**Introduction:** The most common cyst affecting children is the dentigerous cyst. In children, a conservative management approach is taken to minimise disruption to the developing dentition.

**Case Report:** A ten-year old patient presented with intermittent pain from a carious LRE. Radiographic examination revealed a well corticated radiolucency, indicative of a cyst. A cone beam CT showed that the lesion was centered over the crown of the unerupted LR4, with expansion and thinning of the buccal plate and areas of perforation. The findings were consistent with a dentigerous cyst arising from the LR4, which was also merging with the pericoronal follicles of LR3 and LR5. Rather than enucleating the cyst and risk causing damage to the unerupted LR345, the cyst was marsupialised and the carious LRE was extracted. A bung was secured to keep the cyst cavity open.

**Discussion:** This case presented several challenges with patient compliance, including attending multiple appointments, maintaining good oral hygiene, and irrigating through the bung. These were overcome with positive reinforcement, and effective communication to improve patient understanding and gaining parental support. The patient has been under review post-treatment for over a year; the dentition is erupting and exfoliating as expected, and the cyst is self-resolving.

**Conclusion:** This case demonstrates how an early diagnosis, a conservative approach, coupled with patient compliance and parental support, can lead to excellent long-term outcomes when managing a dentigerous cyst in a child. This includes resolution of pain, successful treatment of the cyst and normal development of the remaining dentition.

**Salivary Metal Profile of Vulnerable Children in Brasilia, Brazil**

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**Background:** Contamination of the environment by heavy metals is an important public health issue, which can permanently compromise the health and quality of life of those who come into contact with these substances. In this context, children are often more affected, since they are developing and, consequently, are more subject to the effects of these contaminants. Despite this, there are few studies in the literature, which address the salivary characteristics resulting from environmental contamination. Therefore, the objective of this research was to determine the predictive factors of the health problems of children living in a contaminated area, by quantifying, in saliva, the following chemical elements: Pb, Cd, Na, K, Mg, Ca and correlating the results obtained with caries index (DMFT).

**Methods:** Forty children between 6 and 12-years-old, living in Brasília, whose parents were recyclable material collectors, were selected. The chemical elements were analyzed by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES). Student's t-test or Mann-Whitney and multiple linear regression models were used. Results were expressed as a partial correlation coefficient.

**Results:** The average value of the concentration of Na and Mg was 254.32 +/- 122.23, respectively; with 95% CI (215.23 to 293.41) and 2.77 +/- 1.01; with 95% CI (2.45 to 3.10). Girls showed higher concentrations of Pb than boys ( $p = 0.0223$ ). In children with salivary Pb content greater than 0.30  $\mu\text{g} / \text{L}$ , the prevalence of health problems was 4.57 times higher than in children, whose Pb content was less than 0.30  $\mu\text{g} / \text{L}$ . There was a significant correlation between Cd concentration and DMFT ( $r = 0.412$ ;  $p = 0.0091$ ).

**Conclusions:** The inorganic salivary profile was changed for Na and Mg, for which the values were lower than those indicated in the literature. Girls were probably more exposed to Pb than boys. Salivary Cd was directly related to DMFT. Further studies are needed to better clarify the influence of the chemical elements analyzed.

**Pharmacological Therapy Effects on the Oral Cavity in Pediatric Patients with Epilepsy**

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**Background:** General health and quality of life of patients with epileptic crisis is directly influenced by the dental condition, especially when it involves children. It is important to review the oral manifestations associated with the main medications consumed by pediatric patients with epilepsy.

**Methods:** An electronic search was carried out between March and June 2020 through the databases PubMed, Epistemónikos, EBSCO, SciELO, Cochrane Library, and Google Scholar, scientific journals and retrograde search, using MeSH terms and the keywords "epilepsy", "Pediatric", "children", "dental care", "oral manifestations", "oral care" and "managed dental care" and Boolean terms AND and OR. Articles related to the topic were reviewed, without excluding years or languages, eliminating in vitro or adult studies.

**Results:** Out of a total of 1036 articles, 15 met the applied inclusion criteria. 13 in English, 1 in Spanish and 1 in Portuguese. The reported pharmacological effects on the oral cavity were:

Gingival enlargement (100%): Phenytoin, valproic acid, phenobarbital and carbamazepine.

Xerostomia (60%): Carbamazepine, phenobarbital, valproic acid and/or gabapentin, phenytoin and lamotrigine.

Stomatitis (46%): Carbamazepine, phenobarbital, phenytoin, primidone, valproic acid, lamotrigine, and gabapentin.

Glossitis (46%): Carbamazepine, phenytoin, valproic acid, lamotrigine, and gabapentin.

Gingivitis (40%), facial edema (13%), dysgeusia (6%), ulcers (40%) and erythema multiforme (13%) present different observations.

**Conclusion:** It is important to know the effects on the oral cavity of antiepileptic drugs, as it allows considering the individualization of preventive therapies according to the case and the type of medication used, improving the quality of life of the epileptic pediatric patient.

**Current Treatments for the Management of Oral Mucositis in Pediatric Cancer Patients**

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**Background:** Oral mucositis (OM) is an inflammatory response of mucosal epithelial cells to the cytotoxic effects of chemotherapy and radiation therapy. Children and adolescents are more sensitive to OM due to the rapidity of cellular mitosis and to specific intensive chemotherapy regimens.

**Literature Review:** To investigate the approaches for the treatment of OM in pediatric cancer patients, fifty studies in MEDLINE (via PubMed) between 2010 and 2020 were evaluated. Research inclusion criteria were: scientific papers on children (0-18 years old) undergoing cancer treatment and the methods used in the treatment of OM developing in these patients. Twelve of the fifty studies evaluated met the inclusion criteria. The treatment approaches for OM were as follows: Low-level Laser Therapy (LLLT) application, Palifermin, Honey, Honey Mixture with Olive Oil-Propolis Extract, Propolis, Caphosol, Verbascoside, Polyvinylpyrrolidone and Sodium Hyaluronate (Mucosyte rinse) and Curcumin. According to the literature, Caphosol and Propolis are not effective in the treatment of severe OM. Most of the studies showed that LLLT are capable of reducing the severity of oral mucositis. It has been reported that all other applied materials are safe, well tolerated and effective in reducing the severity of OM.

**Conclusions:** Several studies have been carried out to find an effective treatment for mucositis and its associated pain. There is no single evidence-based approach for the prevention and treatment of OM in pediatric patients undergoing cancer treatment. New traditional alternative medicines and agents which contribute to epithelial restitution and repair are promising alternatives for treating cancer-induced mucositis.

**Covid 19- Oral Manifestation in Pediatric Dentistry**

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**Background:** Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is the strain of coronavirus that causes COVID-19. It has posed a global health emergency scenario. The clinical presentation includes fever, chills, cough, myalgia, breathlessness, ageusia, anosmia, diarrhoea, nasal congestion along with complications of respiratory and vascular systems. The intensity of symptoms in some children are milder as compared to adults. However, few present with Multisystem Inflammatory Syndrome with features similar to Kawasaki Disease, toxic shock syndrome along with oral manifestations including oral mucosal inflammation, ageusia, strawberry tongue, lymphadenopathy, cyanosis of lips.

**Literature review:** A literature search using keywords- oral lesions, COVID-19 and children on google and Pubmed search engine revealed 14,10,00,000 results. Out of which 8 articles/websites relevant to the keyword were included for review. Articles based on general information and duplicate articles were discarded. The World Health Organisation form for Multisystem inflammatory syndrome pertaining to COVID-19 in children mentions a separate section for reporting oral mucosal lesion at the time of admission and discharge/death of patients. Articles and websites listed presence of oral manifestations as part of MIS (Multisystem Inflammatory Syndrome) or isolated observation in COVID-19 affected children.

**Conclusion:** The present literature review highlights the multidisciplinary approach for management of COVID-19 patients and recommends oral examinations as an integral part in overall assessment of COVID-19 affected children.



**A Case Series of Oral Surgical Procedures Performed with Er,Cr:YSGG Laser in Pediatric Patients**

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<sup>2</sup>*Department of Pediatric Dentistry, Faculty of Dentistry, Ain Shams University, Cairo, Cairo, Egypt*

**Introduction:** Currently, the use of Er,Cr:YSGG lasers in various fields of dentistry is gaining popularity due to its versatile nature. It can be used for both hard and soft tissues of the oral cavity by simply altering the settings for an individual procedure. This laser is especially useful in oral surgical procedures in children, as it causes a reduction in the amount of local analgesia needed and in the duration of intervention. The technique is easy, and the laser produces a haemostatic effect that enhances visibility of the surgical area, which is a major advantage in the small mouths of children. The aim of the poster is to highlight the various procedures that are done using Er,Cr:YSGG laser in pediatric patients in a tertiary dental care setting.

**Case report:** A case series of five surgical cases done with Er,Cr:YSGG laser has been reported to the Department of Pedodontics and Preventive Dentistry, Maulana Azad Institute of Dental sciences, New Delhi, India. Post-operative healing and follow up of the cases is shown.

**Discussion:** The laser eliminates the need for sutures and reduces postoperative oedema, bleeding, infection, pain and thus the use of medication which is evident in our cases.

**Conclusion:** The Er,Cr:YSGG laser can be used as an alternative to the conventional scalpel method in children

**Fibro-epithelial Hyperplasia Mimicking Oral Squamous Papilloma: A Rare Case Report**

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**Introduction:** Oral exophytic lesions are pathologic growth that project above the normal contours of the oral mucosa. The oral cavity is constantly exposed to various external and internal stimuli, resulting in several diseases.

**Case report:** An exophytic growth was noticed on palatal gingiva of 64 which had a class II dentinal caries in an 8 year-old female patient. The growth was a pedunculated mass, with small finger like projections, coral pink in colour extending 7mmx5mm mesiodistally and cervicopalatally involving the marginal and attached gingiva. A provisional diagnosis of squamous papilloma and differential diagnosis of verruca vulgaris and chronic hyperplastic gingival tissue were made. The tooth was restored with RMGIC. The lesion was surgically excised completely from the base. Histopathological view showed hyperplastic parakeratinized stratified squamous epithelium overlying a fibrous connective tissue stroma that exhibited dens bundles of collagen which confirmed a final diagnosis of Fibro-epithelial hyperplasia. P16 immunohistochemistry test showed no viral origin.

**Discussion:** Fibrous hyperplasia is a benign soft tissue occurring as a response to a local irritant. Papilloma commonly found in children are benign neoplasm of the stratified squamous epithelium. Histologically, these lesions present as many long, thin and finger-like projections extending above the mucosal surface.

**Conclusion:** The lesion clinically resembled an oral squamous papilloma but on further investigation a final diagnosis of fibro epithelial hyperplasia was made. Hence to come to a definitive diagnosis we cannot rely only on the clinical manifestation of the lesion and further investigations are very important.

Growth and Development, Oral Medicine and Pathology, Restorative Dentistry

### **Maxillary Orthopedic Evaluation in a Pediatric Patient with Osteomyelitis Sequelae**

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Alicia Leonor Pinzón Te

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**Introduction:** Osteomyelitis (OS) is an infectious condition where bacteria permeate through different osseous surfaces, cause local damage, and can affect a patient's general wellbeing. The prevalence of this condition in the maxillary bones in pediatric patients is 1%, which makes its appearance rare, and its management complex.

**Case Report:** A 3-year-old patient was assessed with the presence of an abnormal, asymptomatic growth site in the lower right maxillary region. Upon clinical observation, an increase in volume of approximately 6 cc of the posterior region of tooth 8.4, with bland consistency, and no apparent infectious sites were observed. Upon radiographic assessment, irregularly bordered radiolucent zones in the mandible were observed. The patient was referred and treated in a local hospital, where a MRSA Osteomyelitis diagnosis was confirmed. A year after the surgical treatment, an adequate evolution with an active bone formation zone was observed. In the first phase of maxillary orthopedic assessment, it is decided to tackle the present atypical swallowing, to posteriorly continue with an occlusal rehabilitation.

**Discussion:** Oral rehabilitation in a maxillary affected OS patient represents a challenge due to the vast osseous destruction in the affected site. Proper bone formation must be awaited until rehabilitation can be continued, and this should all be planned, having the patient's biopsychosocial development in mind. The present patient's age allows for early correction and prevention of further developmental consequences.

**Conclusions:** OS sequelae are a challenge due to the destructive nature of the pathology, which interrupts adequate development and therefore causes intermaxillary disharmony.

**Low-level Laser Therapy (LLLT) in the Treatment of Recurrent Aphthous Stomatitis: A Case Report**

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**Introduction:** Recurrent aphthous stomatitis (minor, major or herpetic) is one of the most common oral diseases, of multifactorial etiology and with a genetic predisposition. The diagnosis is clinical, based on history and clinical examination for differential diagnosis with other ulcerative diseases. Low-power laser therapy (LLLT) is a non-invasive method that acts as a cellular photomodulator, reducing pain and inflammation, promoting cellular regeneration of different tissues, and preventing damage.

**Case Report:** 11-year-old boy with a painful injury of 4 months on the posterior edge of the tongue, appeared after a bite. Treatment of antibiotic, NSAIDs and vitamins, without results.

Clinical examination: a yellowish lesion with reddened areas, surrounded by a whitish halo with rounded edges. Hematological examinations and lactic dehydrogenase test are requested to rule out systemic pathology that had had its oral debut. Normal results. Treatment: LLLT, a week later painful decreased, the patient began to eat correctly, after 15 days, a reduction in the reddish edges of the lesion was observed, after one month the lesion had almost completely remitted.

**Discussion:** The nonspecific symptomatic approach of NSAIDs, antibiotics, corticosteroids, and mouthwashes have good results in minor aphthous, but in major aphthous, it loses effectiveness, so LLLT is effective in pain relief and a faster regression of the injury and less discomfort when feeding or brushing teeth, improving the quality of life of the patient

**Conclusion:** LLLT is presented as an effective and non-invasive method that reduces symptoms, promotes and accelerates healing and improves the quality of life of patients.

**A Case Series of Oral Surgical Procedures done with Er,Cr:YSGG Laser in Pediatric Patients**

Dr Gyanendra Kumar<sup>1</sup>, Dr Dina Rabea<sup>2</sup>

<sup>1</sup>*Pediatric Dentistry, Maulana Azad Institute of Dental Sciences, Delhi, Delhi, India*

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**Introduction:** Currently, the use of Er,Cr:YSGG lasers in various fields of dentistry is gaining popularity due to its versatile nature. It can be used for both hard and soft tissues of the oral cavity by simply altering the settings for an individual procedure. This laser is especially useful in oral surgical procedures in children, as it causes a reduction in the amount of local analgesia needed and in the duration of intervention. The technique is easy and the laser produces a haemostatic effect that enhances visibility of the surgical area, which is a major advantage in the small mouths of children. The aim of the poster is to highlight the various procedures that are done using Er,Cr:YSGG laser in pediatric patients in a tertiary dental care setting.

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**Discussion:** The laser eliminates the need for sutures and reduces postoperative oedema, bleeding, infection, pain and thus the use of medication which is evident in our cases.

**Conclusion:** The Er,Cr:YSGG laser can be used as an alternative to the conventional scalpel method in children.

**Compound Odontoma of the Anterior Maxilla Associated with Displaced Lateral Incisor: A Case Report**

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<sup>2</sup>*Child Dental Health, Lagos University Teaching Hospital, Lagos, Nigeria*

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**Introduction:** Odontomas are the most common odontogenic tumors worldwide considered to be developmental anomalies (hamartomas) rather than true neoplasms. They can be differentiated into compound type or complex type with only the compound type resembling tooth structure. Compound odontomas are more commonly found in the anterior maxilla while complex odontomas are more commonly found in the posterior mandible. Odontomas are usually chance findings seen on routine dental examinations. However, on progression they may be associated with bone expansion, late eruption of permanent teeth, and adjacent tooth displacement.

**Case report:** We report a case of an 11-year-old girl who presented at the Lagos University Teaching Hospital (LUTH) pediatric dental clinic with a complaint of painless enlargement of the left anterior maxilla of 2-years duration. The swelling was located between teeth 21 and 22 and was associated with distal displacement and mesial angulation of tooth 22. Clinical, radiographic and histopathologic investigations revealed a compound odontoma. Surgical exposure and enucleation was done to remove the tumor. The patient's postoperative course and 6 months follow-up were uneventful. The patient was then planned for management of the malocclusion.

**Discussion:** Odontomas are clinically significant because they cause impaction and malalignment of both primary and permanent teeth making their prompt and asymptomatic removal of paramount importance for proper teeth eruption and alignment.

**Conclusion:** This report elucidates the importance of routine dental check-ups and minimally traumatic management of odontomas in pediatric dental patients to prevent adverse effects of odontomas thereby, minimizing the interventions needed after enucleation.

**Congenital Granular Cell Epulis of the Newborn: Case Report**

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**Introduction:** A congenital granular cell epulis is a rare, benign soft tissue tumour. It appears as a firmly attached, smooth or lobulated exophytic mass with a broad or pedunculated base. Despite the aggressive appearance of this lesion, it has no growth potential after birth and is non-invasive. The lesion is largest at initial presentation and often undergoes involution or spontaneous regression over time, with surgical intervention required in cases where respiration or feeding are affected. This case report presents pre- and post-operative history and images, as well as histological findings which are essential for definitive diagnosis.

**Case report:** A 3.14kg neonate (female) born at full term, by uncomplicated vaginal delivery, presented with a protuberant tumour-like lesion attached to the soft tissue of the anterior mandibular alveolar crest. This soft tissue mass did not obstruct the airway, but caused a sub-optimal oral seal and feeding difficulties requiring nasogastric tube placement to aid nutrition. Surgical excisional biopsy under general anaesthetic was carried out three days after birth. At three-week review, the patient presented with optimal soft tissue healing.

**Discussion:** Treatment options for a congenital granular cell epulis in the newborn include complete excision or monitoring for regression. Factors determining treatment are airway compromise, feeding, size of the lesion and associated operative risks.

**Conclusion:** This multidisciplinary case demonstrates the importance of parent and multidisciplinary communication for agreement of treatment decisions and management of the newborn presenting with a congenital granular cell epulis.

### **Malignant Infantile Osteopetrosis: A Rare Manifestation of Osteomyelitis in the Maxilla**

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**Introduction:** Malignant infantile osteopetrosis is the most severe form of osteopetrosis with reduce life expectancy. Osteopetrosis can be manifested by extramedullary hematopoiesis which can cause hepatosplenomegaly, anaemia, thrombocytopenia and increase risk of infection besides narrowing of osseous foramen causing visual and hearing impairment.

**Case report:** 10 year-old girl whom is a known case of Infantile Osteopetrosis complicated with Juvenile Myelomonocytic Leukemia (JMML) and hepatosplenomegaly. She presented to us with two episodes of left facial swelling. Upon examination, extraorally there was a swelling on the left cheek sized 5 x 5cm, warm and tender on palpation. Intraorally, child is partially edentulous with presence of dysmorphic and hypoplastic teeth. In the upper left quadrant, there was discharging pus seeping out form the marginal gingiva of necrotic bone. OPG and Cone Beam CT revealed very dense maxilla and mandible with impacted and malformed teeth on both arches. Child was started with oral antibiotics during the first episode of swelling and IV antibiotics during the second episode. Child was then placed under General Anaesthesia to remove all erupted hyperplastic teeth and alveolectomy of upper left maxilla to remove necrotic bone.

**Discussion:** Osteomyelitis is one of the complications of osteopetrosis due to decreased in vascularity of the involved bones, particularly the mandible. It is caused by an odontogenic infection due to caries. The treatment modalities in these cases include surgical debridement and antibiotics.

**Conclusion:** Management of oral infection in Osteopetrosis patient is challenging due to its other comorbidities and risk of improper wound healing.



## Evaluation of the Effectiveness of Two Natural Agents (Olive Oil and Aloe Vera) in the Prevention of Chemotherapy Induced Oral Mucositis in Children

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**Background:** Oral mucositis (OM) is one of the most annoying complications that can result from chemotherapeutic treatment. The purpose of this study is to assess the efficacy of topical application of both olive oil and Aloe vera in comparison to sodium bicarbonate (as a control group) in Reducing the severity of (OM) and delaying its occurrence.

**Methods:** This trial was accomplished at Hematology Department of Hospital of Children of Damascus University, Syria. 4-6 years old, Acute lymphoblastic leukemia (ALL) children were the population from which 36 children were enrolled within the study. They were randomly assigned into three groups (Aloe Vera, olive oil and sodium bicarbonate). Spongeous sticks were used to help in applying the agents on different areas of oral mucosa. Oral mucosa was evaluated weekly up to two months using the World Health Organization grading scale.

**Results:** This study revealed that there was statistically significant difference between olive oil and sodium bicarbonate in weeks two to eight in the recurrence of oral mucositis grades. However, in comparing olive oil and Aloe Vera, there was no statistically significant difference except in the eighth week. Statistically significant difference of occurrence of different grades was recorded in the 2nd, 3rd, 4th and 7th weeks of follow-up period when comparing Aloe Vera with sodium bicarbonate group. Moreover, This study indicated that patients in sodium bicarbonate group begun (OM) sooner than those in other groups.

**conclusions:** Olive oil can be applied topically on oral mucosa in order to prevent (OM) in (ALL) children.

**A Case Series of Sialadenitis in Children Mimicking Odontogenic Abscess- Treated by Sialendoscopy**

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**Introduction:** Extraoral swelling of odontogenic origin is common and sometimes underestimated in children. Usually it occurs secondary to gross carious lesion, trauma or failed endodontic treatment. The main signs and symptoms are pain, swelling, erythema and at times suppuration localized to the affected tooth. Appearance of acute sialadenitis is similar in pediatric population and needs to be differentiated critically and treated appropriately.

**Case report:** Here is a case series of 49 children between the age 3yrs to 14 yrs, reported to dental clinic with signs and symptoms similar to odontogenic abscess, however, with no relevant dental findings. Upon thorough case history, examination, investigation and then referral to an ENT surgeon, the extra oral swelling seen in all the cases was diagnosed as occurring from sialadenitis. The children were subsequently treated by the same ENT surgeon , with sialendoscopy and relieved of the symptoms.

**Discussion:** Recurrent unilateral or bilateral extra oral swellings that appear to have odontogenic origin need to be investigated thoroughly. Sialadenitis in children is 10% of all salivary gland diseases. Treating obstructive salivary gland diseases with sialendoscopy is the most conservative , fast and cost effective way where both the structure and function of the gland is preserved.

**Conclusion:** Odontogenic infections and sialdenitis are equally painful, affecting nutrition and overall health of the child. Acurate diagnosis and treatment by sialendoscopy is a safe and effective way to preserve salivary gland structure and function.

**Use of High and Low-level Laser Devices for Mucocele Treatment in an Infant Patient: Case Report**

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**Introduction:** Mucocele is a benign lesion of minor salivary glands which indicated treatment is surgically removing. The high-intensity laser therapy (HILT) is a surgical option despite the advantages in post-surgical. Moreover, the low-level laser therapy (LLLT) improves the healing process. The objective of this study was to report a case of mucocele removal associating HILT and LLLT.

**Case Report:** 11-years-old female child attended the FOB-USP Pediatric Dentistry Clinic with main complaint of a “little hard ball under the tongue”. After medical history and clinical exam, the diagnostic hypothesis was mucocele. Surgical excision was performed using a HILT (Thera Lase Surgery – DMC): after topical and infiltration anesthesia, with the laser in its pre-programmed function for soft tissue surgery, the mucocele was removed and sent for histopathological analysis. Then the LLLT (Twin Flex - Mmoptics) was used to assist in the process of repair, since there was no need for suturing. The applications were repeated after 24 and 48 hours. Seven days later, in the control appointment, there was no report of postoperative pain and the region was well healed. The patient reported satisfaction with the techniques and procedures used. Histopathological examination confirmed the diagnostic hypothesis of mucocele.

**Discussion:** HILT associated with LLLT for the treatment of mucocele provide a better surgical technique and more comfort during and after operation, besides a satisfactory healing process.

**Conclusion:** This case report showed that the association of laser therapies on surgical treatment is an excellent alternative for a pediatric patient.

**Melanotic Neuroectodermal Tumor of Infancy: A Case Report Emphasizing the Diagnosis Findings**

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**Introduction:** The melanotic neuroectodermal tumor of infancy (MNTI) is a rare, benign neoplasm, presenting as a pigmented lesion that affects mainly maxilla of infants. MNTI diagnosis is performed by histopathological evaluation and the treatment of choice is surgical removal with large healthy margins. Due to its local aggressiveness, MNTI accounts for potential local recurrence, which can lead to multiples surgical removals and also can be even fatal if involving vital structures. The purpose of this report is to present a successful diagnosis of the MNTI.

**Case report:** S.V.B.S, 4 months-old, female with a rapidly progressive swelling in the left anterior region of the maxilla, with no history of trauma. The lesion was a sessile firm mass with no signs of discoloration or ulceration. Occlusal radiography showed an expansive and radiolucent lesion involving the left incisor tooth. An incisional biopsy was performed and microscopic examination revealed islands of a small round neoplastic melanogenic cells surrounded by a fibrocollagenous stroma. Immunohistochemical analysis reveals expression of cytokeratins AE1/AE3 and CD99+, antigen Ki67, VIM and CROMO, confirming the diagnosis of a MNTI.

**Discussion:** MNTI, firstly described by Krompecher in 1918, can be challenging since its rapid growth rate and the risk of local recurrence. The histopathological analysis reinforced the pattern of this tumor, and the immunohistochemical biomarkers evaluation are relevant in the diagnosis of MNTI.

**Conclusion:** The present report highlights the importance of the accurate diagnosis of Melanotic Neuroectodermal Tumor of Infancy for its proper treatment and better prognosis.

**Fibroblastic Variant of Osteosarcoma of the Mandible in a Pediatric Patient**

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**Introduction:** Gnathic osteosarcoma is a relatively rare malignant bone neoplasm and constitute approximately 4-8% of all osteosarcomas. They are usually common in the older age group and show less aggressive behaviour. This paper reports a rare case of fibroblastic variant of osteosarcoma involving the right angle of the mandible in a 12-year-old female.

**Case report:** An otherwise healthy 12-year-old female presented with a mandibular swelling of 2-3 months' duration. There was no history of associated symptoms. Examination revealed a firm, non-tender mass on the right side of the angle of the mandible. Panoramic radiograph showed classical 'sun burst' appearance and computed tomography showed evidence of periosteal reaction breaching the cortical boundary with adjacent soft tissue invasion. Ultrasound imaging also revealed signs of expansile lytic lesion with erosion of cortical bone. Histopathological examination confirmed the diagnosis of fibroblastic osteosarcoma.

**Discussion:** Swelling is the most common presenting symptom in patients with gnathic osteosarcoma. Radiographic and histopathologic examination is crucial in the diagnosis of osteosarcoma. Radical surgical excision is the preferred choice of treatment for gnathic osteosarcomas. Radiation and chemotherapy may be used as adjuvant therapies. Fibroblastic osteosarcomas have shown good response to chemotherapy.

**Conclusions:** Early diagnosis and prompt treatment results in better prognosis, longer survival rates and better quality of life in patients affected with osteosarcoma.

## **Management of Fascial Space Infection with Rhinosinusitis Secondary to Periapical Abscess in Relation to Maxillary Deciduous Molar in an 8-year-old-Child: A Case Report**

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**Introduction:** Fascial space infections are one of the pediatric surgical emergencies and early diagnosis is particularly important as the symptoms can progress rapidly, producing various systemic manifestations. Head and neck space infections are usually secondary to odontogenic infections because of the translocation of oral microbes to fascial space via the odontogenic route. Following case report highlights the importance of multidisciplinary approach in managing complicated space infection.

**Case report:** A case of a fascial space infection of the oral and maxillofacial region was treated by incision and drainage under general anesthesia involving a multidisciplinary team. Ultrasonography reported periorbital cellulitis, buccal and infraorbital space infection secondary to periapical abscess in-relation-to carious 55. Incision and drainage of right buccal and infraorbital space infection via intraoral approach, extraction of 55 followed by placement of corrugated rubber drain was performed. After four days of surgery, infraorbital swelling persisted while the buccal swelling decreased in size. The CT-Orbit and PNS reported rhinosinusitis for which the second surgery of sinus was performed.

**Discussion:** Space infection in children is an emergency condition that can progress rapidly resulting in fatal outcomes. Established treatment of fascial space infection is incision and drainage or decompression of space with the administration of broad-spectrum antibiotics along with removal of the nidus of infection.

**Conclusion:** In the case, incision and drainage and removal of the source of infection followed by sinus surgery brought about the satisfactory recovery within a follow-up period of one month. Multidisciplinary expertise provided us with the best therapeutic result.

### A Congenital Epignathus in a 3-day old Neonate

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**Introduction:** Congenital epignathus teratomas are rare benign neoplasms often composed of tissues from the three germ layers. They can present in the nasopharynx, oropharynx or more rarely in the oral cavity alone. They are benign but can be associated with breastfeeding issues, a failure to thrive and airway obstruction. A review of the literature suggests early resection as the preferential management due to functional and aesthetic reasons. This report presents a case of epignathus affecting a 3-day old girl.

**Case Report:** This patient presented to an Accident and Emergency department with jaundice and 12.5% weight loss because of poor feeding due to an oral mass. Urgent referral to OMFS was made who noted a 2 x 3 cm pedunculated firm painless mass on the left mandibular alveolus causing impaired latching. Antenatal scans and maternal medical history were clear. No immediate airway obstruction was evident. Nasogastric feeding, triple phototherapy and support from the breast-feeding team helped resolve feeding issues, weight was gained and mother and child sent safely home. Out-patient follow up was undertaken to check for changes in the lesion and plan future resection. Clinical photographs aid to illustrate this case.

**Discussion:** This case emphasises the importance of liaison with the breast-feeding support team to help reduce the need for emergency general anaesthetic and surgery in the neonate.

**Conclusion:** Breast feeding support teams may successfully aid the management of neonatal patients presenting with sizeable oral lesions.

**Assessment of Knowledge and Practice regarding Safety Standards of Oral Radiology in Pediatric Patients among Dental Practitioners in Belgaum City a Cross Sectional Study**

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**Background:** Radiation guidelines for minimization of hazards have been devised for healthcare professionals by various government and institutional agencies. However, correct knowledge and the judicial practices of the same must be assessed from time to time.

**Methods:** Twenty-four close ended, self-administered questionnaires were distributed among 150 dental practitioners in Belgaum city, Karnataka, India. On attaining informed consent, a pilot study was conducted on 10 subjects and the performer was finalised. The survey was designed to assess the radiographic technique, safety measures followed and the quality of image obtained. The Data was analyzed using SPSS software (version 21). Results were calculated by frequency distribution and compared using chi square test.

**Results:** The study showed that 35% of the dentists had to repeat the radiograph before obtaining a good image. More females than males wore lead aprons. 80% of the dentists preferred bisecting angle technique compared to paralleling technique. 25 % of the dentists stood behind a protective wall during radiation exposure.

**Conclusions:** The implementation of standards of quality care for radiography and radiation protection should be followed diligently among dentists. An elaborate educational program in dental radiography is a prerequisite towards the use of ionizing radiation in order to meet guidelines put forward by the atomic energy regulatory board of India.



**Pyogenic Granuloma of Buccal Mucosa in A Nine-Year-Old Male Child: A Rare Case Report**

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**Introduction:** Pyogenic granuloma is a benign inflammatory tumor-like lesion. It is mainly caused by low-grade irritation, traumatic injury, or hormonal factors. It predominantly occurs in the second decade of life in females, commonly involves anterior maxillary gingiva, and rarely found on lips, tongue, palate, and oral mucosa. The objective of this case report was to report a rare case of pyogenic granuloma.

**Case report:** A 9-year-old male child reported to our department, complaining of a swelling on the left side of the cheek inside the mouth for 2 months. The child had a positive history of habitual cheek biting. Intraoral examination revealed a well-circumscribed single pedunculated, an erythematous tissue mass of size 9 x 6 x 4 mm<sup>3</sup>. On palpation, the lesion was firm in consistency, non-tender without pulsation. The tissue mass was excised from the base using a scalpel and blade under local anesthesia followed by primary tissue closure with 4-0 silk suture. Histopathological examination of the tissue was done.

**Discussion:** Extra-gingival pyogenic granuloma is a diagnostic challenge for clinicians. This emphasizes the importance of a thorough history and clinical examination. In our patient, the probable etiologic factor was habitual cheek biting. Histopathological examination is necessary for the final diagnosis of such an intraoral lesion.

**Conclusion:** Our case report was rare with the unusual age and gender of the patient with an unusual site of the lesion. We diagnosed and treated the patient successfully without a sign of recurrence in 1-year follow-up.

**Minor Physical Anomalies in Children with Sickle Cell Disease: A Case-Control Observational Study**

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**Background:** Minor physical anomalies (MPAs) are morphological variations which are usually painless and harmless owing to adverse genetic and environmental factors and includes palatal rugae pattern and its dimensions. Sickle cell disease (HbSS) is the homologous condition in which polymerisation of Hb-S causes fragility and sickled shape haemoglobin under altered conditions leading to developmental disorders as well as delayed growth. The purpose of this research work was to study palatal rugae and its dimensions in children with SCD.

**Methods:** The primary alginate impressions were obtained from 50 children aged 10-18 years with SCD (study group) and 50 normal healthy children (control). Casts were poured in dental stone and palatal rugae and palatal dimensions were imprinted, examined and recorded. Data was statistically analysed using SPSS software 22.0 version.

**Results:** A total of 993 palatal rugae were observed, out of which 460 and 530 were in the study and control group, respectively. However, the fragmentary rugae were significantly lower in the study group. The height and centre of the palatal arch were also significantly lower in the study group. Although, no statistical difference was found for the width of the palatal arch among the groups.

**Conclusions:** Lesser number of fragmentary rugae, lower height and centre of the palatal arch were inferred in children with SCD might be related to delayed growth in patients with sickle cell disease which in turn delays vertical facial growth. These peculiar MPAs could serve as an early identification tool for the detection of SCD from the clinical perspective.

## Dentigerous Cyst Observed in the Mixed Dentition Period: A Case Report

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**Introduction:** The dentigerous cyst is the second most frequent odontogenic cyst after the radicular cyst. Typically, dentigerous cysts are asymptomatic and are commonly diagnosed incidentally. They are benign odontogenic cysts associated with the crowns of permanent teeth and usually are characterized as unilocular radiolucent lesions which are rarely seen during childhood.

**Case report:** A 10 year-old girl presented to our clinic due to caries in primary teeth. A panoramic radiograph of the patient revealed properly limited radiolucent areas associated with the crowns of the permanent premolar teeth in the lower left jaw. Iodoformed sponge was inserted into the socket after the first and second primary molars were removed under local anesthesia. The sockets were washed with isotonic serum every day for the first week; and this procedure continued one day a week after the first week. In order to prevent epithelialization in the extraction socket site and to prevent mesialization of the lower left 1st molar, a movable placeholder was planned that could enter into the extraction socket.

**Discussion:** Treatment of this lesion when seen in the mixed dentition requires sensitivity due to the risk of damage to developing permanent teeth. It is important to choose a treatment method correctly and to apply minimally invasive surgical procedures.

**Conclusion:** It was concluded that when treating dentiginous cysts in the mixed dentition period, it is more conservative to perform lesion decompression instead of enucleation and curettage procedures.

**Oral Manifestations of Celiac Disease in Children - Clinical Features**

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**Introduction:** Celiac Disease (CD) is characterized by chronic intolerance to prolamin proteins, components of the gluten molecule, which results in an inflammatory response in the small intestine, triggered by an autoimmune mechanism in genetically susceptible individuals. In recent years there has been an increase in the number of diagnosed cases in different countries; however, as a result of the variability of signs and symptoms, it is estimated that in many individuals, the diagnosis fails because it is late or even absent. The oral cavity of children with CD can present several changes, which can occasionally constitute the single sign of this pathology.

**Case report:** Clinical description of patients between the ages of 6 and 8 years, diagnosed with CD, will be presented, aiming to illustrate oral manifestations present in this pathology, such as enamel defects, recurrent aphthous stomatitis, geographical tongue and angular cheilitis .

**Discussion:** Recurrent aphthous stomatitis and enamel defects are the most common oral clinical signs in children with CD, and may be the only signs of the disease in atypical forms. Angular cheilitis, geographic tongue, delayed tooth eruption, lichen planus, atrophic glossitis, microdontia and dysfunction of the salivary glands are also reported.

**Conclusion:** Diagnosis of CD based on findings from the oral cavity seems to be promising, given the safety and easy accessibility; however, complementary diagnostic tests are often required. In addition, changes in oral morphology in celiac patients may constitute a complementary marker of diet compliance.

### **Quality and Readability of Web content on Ankyloglossia using the DISCERN tool and Flesch Readability Scale**

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**Background:** Tongue-tie or ankyloglossia is a congenital anomaly that causes restriction of tongue movements. Parents of children with ankyloglossia are most worried as it affects speech, breast feeding, deglutition etc. Patients and the general public often search online to understand such conditions. The information online is largely unregulated and hence a review of websites would enable patients to have a clear picture of such congenital anomalies.

The purpose is to assess the quality and readability of online information on ankyloglossia by evaluating websites using the DISCERN instrument and the Flesch reading ease (FRE) scale.

**Methods:** An Internet search was done using Google search engine with relevant search terms. The first 50 sites from the search engine were screened and the DISCERN instrument was used to assess the quality of the information and readability was assessed using the Flesch reading ease (FRE) scale.

**Results:** The DISCERN quality scores ranged from 31 to 66 (Mean = 45.5, SD = 8.14) with 14% and 52% categorized a Good and Fair. FRE scores ranged from 27 to 67 (Mean = 41.9, SD = 14.14) representing difficult readability.

**Conclusion:** The internet information on ankyloglossia is incomplete, complex and poorly organized. Thus it varies in quality and readability. Information on treatment risks and benefits need to be more accurate so as to get a clear picture and ease their anxiety before visiting the clinician.

**Diversifying the Purview of Pediatric Oral Pathological Conditions**

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**Introduction:** Oral pathological lesions are a relatively common occurrence in the pediatric population. Fortunately, most of these lesions are transient and can be diagnosed clinically; however, a few may require biopsy for diagnosis and/or surgical excision for treatment. This poster is a compilation of oral pathological lesions encountered commonly, which should assist the practitioner in diagnosing and managing such lesions.

**Case report:** Common developmental disturbances like ankyloglossia, fissured tongue, geographic tongue, natal teeth and amelogenesis imperfecta, cysts of the oral cavity, various pulp pathologies like polyps, odontogenic tumors in the oral cavity, gingival and periodontal conditions and dermatological lesions were encountered over a period of time prompting a quick discussion towards the diagnosis and management of such lesions.

**Discussion:** Identification of pathological conditions timely and correctly helps bring about early intervention to restore what is considered as normal in the oral cavity restoring function also along with.

**Conclusion:** This poster attempts to spread awareness about the commonplace occurrence of pediatric oral pathological conditions.

### **Therapeutic Effects of Andiroba Oil, Compared to Low Power Laser, on Oral Mucositis in Children Underwent Chemotherapy: A Clinical Study**

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**Background:** The *Carapa guianensis* Aubl, popularly known as andiroba, commonly found in the Amazon region. The oil extracted has high anti-inflammatory and analgesic potential, which are the basic prerequisites that can be used in the treatment of oral mucositis (OM). This study evaluated the therapeutic effects of andiroba gel on the symptomatology and evolution of OM in children with leukemia who underwent chemotherapy and to compare it to the effects of low power laser.

**Methods:** This randomized, double-blind clinical trial involved 60 children with leukemia, both genders, aged 6 to 9. The patients were divided into two study groups: the andiroba group (n = 30) and the laser group (n = 30). The level of pain experienced by the patients was assessed using the Wong-Baker visual analog scale and the degree of severity of OM was assessed using a table, recommended by the World Health Organization that depicts the degrees of severity of OM. The data obtained were analyzed using the Mann-Whitney test.

**Results:** A statistically significant reduction in the degree of OM was observed on the fourth, fifth, and sixth days and in the pain scores on the second, third, and fourth days in the andiroba group after the manifestation of OM, compared to the laser group.

**Conclusions:** The use of andiroba oil effectively reduced the severity of OM and relieved pain, which resulted in a decrease in the severity of signs and symptoms in the patients in the andiroba group, compared to the laser group.

### The Relation between Maternal Age and the Occurrence of Non-Syndromic Oral Clefts

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**Background:** Oral cleft is one of the congenital anomalies that most affects the world population. The incidence may vary with geographic location and socioeconomic conditions. The etiology is considered multifactorial and it's associated with genetic and environmental factors. Studies of possible factors that could be involved with the oral clefts are still scarce in Brazil. The main objective of this study is to investigate the relation of maternal age during pregnancy and the occurrence of non-syndromic oral clefts.

**Methods:** The study was made in a reference center in Minas Gerais, Brazil. The sample was composed by diagnosed patients with non-syndromic oral clefts and attended during the years of 2009 to 2019. The data was collected through the application of a questionnaire.

**Results:** The sample was composed of 425 patients. After the analysis of the data, it was possible to identify the prevalence of cleft lip and palate in male sex, which was 49% of the cases. In the female sex the predominance was of isolated cleft palate with 53% of the cases. In relation to maternal age, it was observed the prevalence of cleft lip and palate in mothers above of 35 years old during the pregnancy.

**Conclusions:** The evaluation of the data shows the prevalence of cleft lip and palate in the male sex and the cleft palate in female sex. Regarding to maternal age, it was observed the predominance of cleft lip and palate in mothers which were more than 35 years old, but there wasn't a statist significance.



**Early Diagnosis and Multiprofessional Approach to an Infantile Hemangioma Case: 1-year Follow-up of Propranolol Treatment**

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**Introduction:** Infantile Hemangioma (IH) is a common benign vascular tumor in childhood, being more prevalent in females.

**Case report:** It aims to present an infantile hemangioma first detected by a pediatric dentist, in a 4-month-old girl. The infant was referred to the university pediatric dentistry department due to purple spots on the tongue. Clinical examination gave rise to the hypothesis of infantile hemangioma at the right side of the tongue. Infant was referred for a pediatric vascular surgeon who after magnetic resonance imaging established a diagnosis of infantile hemangioma. Treatment option was oral propranolol, following FDA recommendation (2014). After six months, clinically significant regression was observed and pediatric surgeons interrupted propranolol usage. One-year follow-up revealed that clinical lesion's dimensions remained stabilized as when propranolol was discontinued.

**Discussion:** The case here described emphasizes the importance of pediatric dentists in diagnosis and prompt treatment of oral lesions in infants. Besides, the pediatric dentist took part in monitoring infant's oral health concomitantly to lesion control. Parents were advised about oral health care and about measures to prevent trauma of the lesion that could cause bleeding, ulcerations and secondary infections. Special attention was given to dental eruption because of accidental bite injury while playing or walking, and also to avoid putting sharp-pointed objects into mouth.

**Conclusion:** This case highlights the importance of a multi professional approach to early diagnosis and prompt treatment of oral lesions. Education about oral health care and trauma prevention were key factors to prevent complications through 1-year of follow-up.

**Dental Cementum Involvement on Apical Sealing following Endodontic Treatment on Dogs**

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**Background:** Few studies have detailed the histological features that should be observed under the microscope to consider a case as histologically repaired and therefore, successful. Considering this, the purpose of this paper is to report the histological features observed in dogs' teeth with apical periodontitis following endodontic treatment.

**Methods:** 40 mature roots of dogs' premolars that underwent or not endodontic treatment after experimental inductions of periapical lesions were analyzed. The teeth endodontically treated, underwent a two-session treatment, using a calcium hydroxide-based paste as an intracanal medicament between sessions (Calen®, SS White, São Paulo, Brazil) for a 14-days period. After 120 days of endodontic treatment, euthanasia was performed, and teeth were processed and stained with HE coloration. Specimens were observed under conventional and fluorescent light and characteristics were described.

**Results:** In endodontically-treated specimens, we observed that repair of external and internal surfaces of resorbed dental cementum initiated by repopulation of the inactive Howship's lacunae by cementoblasts, blood vessels and collagen fibers derived from former cementum. Cellular cementum (CC) filled external and internal resorption lacunae in a laminar distribution parallel to the root surface, and reversal lines between newly formed cementum were observed. CC invaginated into the internal resorption lacunae and filled the enlarged cementocyte lacunae and, in advanced stages of repair, apical foramen was sealed with a mineralized tissue originated from the CC.

**Conclusion:** We conclude that CC involvement in repair after endodontic treatment of teeth with apical periodontitis may be considered as a positive marker in effectiveness evaluation.

**An Unusual Case of Submandibular Sialolithiasis in a 4-year-old Patient: A Case Report**

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**Introduction:** Sialolithiasis is the most common disease of the salivary glands and it is characterized by the development of calcified structures within the duct. This condition is rare in childhood and can lead to inflammation and bacterial infection. The treatment goes from direct massage of the duct to complete removal of the gland.

**Case report:** This report describes an unusual case of submandibular sialolith in a 4-year-old girl. The patient was suffering from eating-related pain and swelling in the floor of his mouth. The clinical diagnosis identified a sialolith in the submandibular gland duct. Since the salivary stone was palpable and localized upfront in the duct's gland, a minimally invasive procedure was planned. An excisional biopsy was performed, and a stone was sent to anatomopathological diagnosis.

**Discussion:** Only 3-5% of all sialolith cases occur in children; and there is no evidence yet proving the true origin of this type of calcium deposit. Sialoliths are clinically round, usually unilateral, and most commonly located close to the lingual frenum. Management of sialolithiasis should begin with conservative measures including massage and stimulation of the gland. Conservative surgery involves a small excision that exposes the salivary stone trapped in the duct, removing it in a totally excisional manner. The minimally invasive procedures have excellent success rates with minimal morbidity.

**Conclusion:** Although rare in children, sialolithiasis has a variety of symptoms and can be challenging to the pediatric clinicians. Understanding the diagnostic process and the different modalities of treatment will lead to extremely favorable prognosis.

**Management of Dentigerous Cyst in a Pediatric Patient**

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**Introduction:** Dentigerous cysts (DC) are the most commonly observed developmental odontogenic cysts and can rarely manifest in the first decade of life. This is a case report of a large DC in a 10-year-old male patient treated conservatively by marsupialization, resulting in saving the 1st premolar tooth in relation to the cyst.

**Case Report:** Patient was referred to our clinic with complaints of swelling in the right maxillary region without pain complaints. Radiographic examination revealed a radiolucent lesion in the right maxilla with the association of the first and second permanent premolar crowns and primary molar teeth apices. Under local anesthesia, the first and second primary molar teeth were extracted and the cyst was reached through the extraction socket for drain installation. During the follow-up period, it was observed that the volume of the cyst decreased radiologically but complete healing was not observed. Besides, the axis of the impacted second premolar was observed inversely positioned. So, the second premolar was extracted and the cyst was enucleated; by paying attention to not to damage the first premolar aside. Histopathological features revealed the lesion characteristics as DC.

**Discussion:** The routine treatment option is the enucleation of cyst, extraction of the involved teeth for decreasing the chances of recurrence. However, in children due to the great regenerative potential, marsupialization can be considered as the first treatment option. When inserting the drain care must be given in order to keep correct positioning of the future permanent teeth.

**Conclusion:** Marsupialization technique is an ideal approach to treat large DCs in pediatric patients. It's observed that, if permanent teeth are left undisturbed during the treatment they can erupt in the oral cavity.

**Congenital Granular Cell Epulis: Case Report**

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**Introduction:** Congenital granular cell epulis (CGCE) is an uncommon benign lesion of unknown etiology that mainly affects the alveolar mucosa of fetuses and newborn girls, which may cause respiratory and feeding difficulties.

**Case report:** A 16-days-old female patient exhibiting an exophytic nodular lesion, covered by smooth pink mucosa with erythematous and ulcerated areas, measuring with 4 cm in diameter, located at anterior maxilla on the alveolar ridge since birth. The clinical hypothesis of CGCE was established, and the patient underwent excisional biopsy. Microscopically, a sheet-like proliferation of eosinophilic cells with granular cytoplasm was observed in a stroma of vascularized fibrous connective tissue. The immunohistochemical analysis for S100 evidenced the absence of immunostaining. The CGCE hypothesis was confirmed and, after two years, the patient showed no signs of recurrence of the lesion.

**Discussion:** Among the histopathological differential diagnoses are granular cell lesions, such as granular cell tumor, granular cell odontogenic tumor and adult rhabdomyoma. The knowledge of its clinical characteristics is crucial in performing a correct diagnosis: related to the period of development, site of involvement, lesion size and growth potential. The clinical hypothesis can only be established with the histopathological characteristics.

**Conclusion:** The treatment of CGCE is surgical excision, since there are few reports of regression of the lesion, beyond this, it may result in mouth closing limitations and respiratory and feeding difficulties, interfering in the patient's quality of life.

**Adenomatoid Odontogenic Tumour: A Case Report**

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**Introduction:** Adenomatoid odontogenic tumour (AOT) is an uncommon benign odontogenic tumour with an incidence of 1%. AOT is seen predominantly in the maxillary anterior region in association with an unerupted tooth. The tumour is most often diagnosed in the second decade of life. The radiographic findings of AOT frequently resemble other odontogenic lesions such as dentigerous cysts or ameloblastoma.

**Case report:** A 14-year-old male patient came to the Department of Pediatric and Preventive Dentistry with the chief complaint of the unerupted tooth and asymptomatic mild swelling which was slowly growing on the right side and front region of the upper jaw for 6 months. Intraoral examination revealed missing tooth #11 and a solitary hard diffuse swelling on the labial aspect of missing right central incisor measuring about 1x1.5cm. IOAPR showed a well-defined unilocular radiolucency with impact11. Based on the history, clinical examination and radiographic findings, dentigerous cyst, central ossifying fibroma and AOT were considered under differential diagnosis. The operative procedure involved surgical excision of the tumour, measuring approximately 1.8x1.8x2.0cm, along with the extraction of impacted tooth #11 followed by placement of bone graft. The specimen was sent for histopathological examination, which confirmed the diagnosis of AOT. Nine months of clinical and radiographic follow up after the surgery showed no recurrence.

**Discussion:** AOT is intraosseous, but can occur rarely in peripheral locations. The lesions are asymptomatic and are associated with cortical expansion.

**Conclusion:** AOT is a benign, slow-growing lesion. The treatment is conservative and the prognosis is excellent.

**Osteoma of the Anterior Maxilla in a Paediatric Patient: A Case Report**Dania Siddik<sup>1</sup>, Sarah Barrow<sup>1</sup>, Vinod Patel<sup>2</sup><sup>1</sup>*Department of Paediatric Dentistry, Guy's and St Thomas' NHS Foundation Trust, London, UK*<sup>2</sup>*Department of Oral Surgery, Guy's and St Thomas' NHS Foundation Trust, London, UK*

**Introduction:** Osteoma is a benign, slow growing bone forming a tumor. It usually arises on surfaces of the cranial vault, jaw, paranasal sinus and orbit. Osteomas affect all age groups, although they are rare in children. This is an uncommon case of an osteoma which has been followed for over five years both clinically and radiographically in a ten-year old female patient.

**Case Report:** At initial presentation, the patient's principal complaint was a three-year history of a gingival mass associated with the attached mucosa on the labial aspect of the right and left upper permanent incisors. Intra-oral examination revealed a 6mm by 7mm bony mass in the anterior maxilla region. Further investigations including ultrasound examination and cone beam computer tomography (CBCT) were taken. The mass became an increasing aesthetic concern for the patient and an excisional biopsy was arranged under general anesthesia. Histopathological analysis revealed features compatible with an osteoma. Three months following surgery and during the COVID-19 outbreak a follow up video consultation was arranged and there has been no clinical sign of recurrence.

**Discussion:** A thorough medical and family history should be taken when a patient presents with a suspected osteoma. Asymptomatic osteomas should be managed conservatively, with surgical intervention only provided if symptomatic or when function or aesthetics are impaired.

**Conclusion:** Osteoma is a rare benign tumor which rarely affects children. This report demonstrates the involvement and importance of a multi-disciplinary team and the step by step approach to the surgical management of the mass.

Epidemiology, Oral Medicine and Pathology, Special Needs Patients

### **The Care of the Children at Risk at the Dental Consultation and Treatment Center of Casablanca in Morocco: Parents Satisfaction Survey**

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**Background:** Dentists in pedodontics encounter a huge number of children with systemic conditions. The relationship between oral health and general health is close and well known now. Parent`s satisfaction is a significant indicator in the care results. Such an approach is part of a quality process allowing to target the changes to be made in order to optimize the care in the service of pedodontics. The study aims to rate the parental satisfaction of children at risk according to the care provided to them in the service of pedodontics in Casablanca

**Methods:** this cross-sectional epidemiological survey was conducted on 212 children at risk. This study was made up by patients followed up withing the pediatric dentistry service in Casablanca for 3 months. Parents were asked to complete a questionnaire during each visit that dealt with the different dimensions of satisfaction.

**Results:** according to this study it appears that: 76% of the parents thought that the treatment received were appropriate, 90% of the parents will definitively recommend the service of pedodontics to other people and parents were more aware of the service around the care (delay of appointment, kindness..) than the dental treatment itself.

**Conclusion:** Several studies have been conducted showing the satisfaction of the care provided in a dental center. The measured satisfaction does not make sense. It should rather generate feedback improving the treatment performance of the health facilities.



### Developing Odontoma (Ameloblastic Fibro-odontoma) in a Pediatric Patient: Diagnostic Criteria and Surgical Management

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**Introduction:** Odontoma is the most common odontogenic tumor, representing from 21% to 67% of all odontogenic tumors, often affecting patients between the first and second decades of life. It is considered that ameloblastic fibrodentinoma (AFD) and ameloblastic fibro-odontoma (AFO) could continue to mature into fully calcified lesions, being indistinguishable from a developing odontoma, and should be diagnosed as such.

**Case report:** A 9-year-old girl was referred presenting a volume increase in her left hemiface. A panoramic radiograph evidenced a radiopaque lesion surrounded by a radiolucent halo, occupying the left mandibular body and ramus, and involving the teeth #75 and #36. After incisional biopsy, a diagnosis of developing odontoma (AFO) was made. The patient underwent surgery under general anesthesia, and the lesion was fully removed. After 2-year follow-up, the patient is well, with no recurrences or changes.

**Discussion:** Developing odontoma, as described here, as well as due to the experience of previous cases reported as AFD or AFO, should be treated in a conservative manner. However, it appears that some AFO and AFD cases may be true neoplasms. Thus, strict clinicopathological correlation in order to achieve the correct diagnosis is strongly recommended.

**Conclusion:** Developing odontoma should be considered in the differential diagnosis of a tumor mass affecting the jaws, especially in pediatric patients. The conservative surgical treatment appears to be successful, such as shown in the current case

**Photodynamic Therapy in the Peri-oral Region in a Patient with Pigmental Xeroderma: Case Report**

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**Introduction:** Assistance to patients with systemic impairment should be welcoming, comprehensive and humanized care as a way of establishing a link between the subjects, the patient and the multidisciplinary team and developing the patient's autonomy in their self-care. Xeroderma Pigmentosum (XP) is a rare disease that causes neurological changes in the skin and eyes. Dentistry can play an important role in improving the quality of life of these patients. The work aims to present the importance of multidisciplinary work in patients with XP.

**Case report:** Female patient, 17 years old, with a history of XP and metastatic melanoma. The patient had generalized skin changes, changes in the mouth opening, difficulty in feeding and oral hygiene due to pain.

**Discussion:** The patient was submitted to a speech therapy-, medical- and dental approach. The dental approach aimed at improving oral hygiene and pain relief. To date, there is no effective clinical treatment for XP. After multi-professional care, the patient showed improvement in mouth opening, swallowing and pain in the oral cavity. The dental team provided guidance on oral hygiene and the application of photodynamic therapy to relieve pain.

**Conclusion:** During the sessions, there was a reduction in painful symptoms in the oral region, improvement in speech, swallowing and monitoring of skin changes presented by the patient. We note that multi-professional care is of great importance since it can improve the quality of life of this patient.

### Changes in Pediatric Dentistry during the COVID-19 Pandemic

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**Background:** The COVID-19 pandemic has affected over 17 million people worldwide, 1.3 million in the United States, and more than 55,000 individuals in the city Chicago [1, 2, 3]. People of advanced age with comorbidities are at higher risk [4]. Children, on the other hand, are typically asymptomatic but contagious [5, 6]. At the same time, the practice of dentistry comprises the use of aerosols that could potentially transmit the disease.

**Literature Review:** In response to the COVID-19 pandemic, healthcare institutions have introduced changes to protocols in order to protect personnel and minimize the spread of the disease. Two critical changes are the use of universal personal protective equipment (PPE) and pre-procedural screenings. Surgical procedures that generate aerosols might pose a risk of transmission if the patient is COVID-19 positive [7]. On April 1st, 2020, Virginia Mason Medical Center proposed screening all asymptomatic patients prior to any surgical or procedural care [8]. This strategy was adopted by multiple medical institutions. Furthermore, the CDC indicates that “SARS-CoV-2 testing of asymptomatic patients might be used to further reduce the risk for exposures in some healthcare settings” [9]. SARS-Cov-2, the virus that causes COVID-19, is present in high concentrations in the oral cavity and the pharynx. In addition, dental procedures are known to generate aerosols [10].

**Conclusion:** Oral health providers are at high risk of getting infected if they treat positive COVID-19 patients; however, the use of pre-procedural screening prior to dental treatment has not been universally adopted.

**Streptococcus Pluranimalium: A Case Report of a Rare Cause of Mandibular Osteomyelitis in an Infant.**

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**Introduction:** The Streptococcus genus of bacteria are well known to oral health care providers to be part of the initial colonizers of oral flora. We present a case of an infant who developed mandibular osteomyelitis by Streptococcus Pluranimalium.

**Case Report:** A 14-month-old arrived at the accident and emergency department at Grey's Hospital in Pietermaritzburg, South Africa. The patient presented with a large, right sided facial asymmetry which started 5 days prior. The infant had no co-morbidities or previous significant facial trauma. Clinical examination revealed a firm but fluctuant and a yellow discharge into the ear canal. Computed Tomography revealed a pathological fracture of the right mandibular condyle neck and features in keeping with mandibular osteomyelitis. The collection measured 4,7cm (AP) x 4,5cm (TV) x 7cm (SAG). Incision and drainage and exploration was performed under general anesthesia. The mandibular condyle head, which was sequestered, was removed and a swab of the pus was done for laboratory testing. Microculture and sensitivity testing revealed Streptococcus Pluranimalium to be the cultured pathogen.

**Discussion:** Streptococcus Pluranimalium is a recently identified multispecies bacterial organism known to cause suppurative infection of the brain, subdural space, endocarditis and septicemia in humans.

**Conclusion:** The new Streptococcus Pluranimalium can include osteomyelitis in its pathogenesis. To our knowledge at the time of submission this is the first reported case involving the mandible.

**Peripheral Ossifying Fibroma in Seven-month old Infant: A Case Report**

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**Introduction:** POF is defined as a well demarcated and occasionally encapsulated lesion consisting of fibrous tissue containing variable amounts of mineralized material resembling bone. It is a reactive, non-neoplastic lesion found on the gingiva. The lesion has female predilection and its recurrence rate is considered high. It is mainly seen in maxilla and the common sites involved are gingiva anterior to the molars and the interdental papillary region.

**Case report:** A seven-month old male infant reported to the Department of Pediatric and Preventive Dentistry with his parents with a complaint of a lump in his lower front region of the mouth which was causing interference during nursing. History revealed that he had two mandibular anterior natal teeth which were extremely mobile and shed off without any treatment. The lesion was excised using laser, under local anesthesia and the tissue was sent for histopathological examination. Based on clinical and histopathological finding diagnosis of peripheral ossifying fibroma was made.

**Discussion:** POF occurrence is uncommon in infants. According to Bodner and Dayan, POF may occur at any age, but rarely occur before 10 years of age.

Differential diagnosis: Peripheral Giant Cell Granuloma, Pyogenic Granuloma

**Conclusion:** Clinically, it is difficult to differentiate between most of the reactive gingival lesions. POF is uncommon among infants, it should be included in the differential diagnosis in cases of anterior alveolar masses in infants

**"Help Illuminate the Rare Reality"**

Bhagyashree Bhatt

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**Background:** Paediatric onset of Behcet's disease is very rare and carries a strong genetic component. Oral ulcers and fever of unknown origin are frequent at onset and difficult to distinguish from other inflammatory disorders; therefore, expert opinion is still mandatory to recognize the disease early. Behcet's disease (BD) is a chronic, multisystem inflammatory disease that generally begins with ulcers of the oral mucosa, and then is characterized by recurring mucocutaneous lesions of the oral cavity, genitalia, and dermis, and involvement of the ocular, vascular, digestive and nervous systems.

**Literature review:** Behcet's disease commonly observed in the second or third decades, the initial symptoms occur under the age of 16 years in 4%–26% of the patients. Paediatric patients have generally few symptoms, and the time to diagnosis is long - between 3 and 5 years. The precise etiology of BD is unclear; however, the clinical presentation begins with oral aphthous ulceration and progresses to systemic involvement. Seoudi N et al., stated that oral ulceration is often the presenting symptom of Behcet's disease. The composition of the oral mucosa and salivary microbiome is thought to be one trigger of disease flares. Improvement of dental and periodontal hygiene has been associated with a decrease of oral ulcerations.

**Conclusion:** Dentists play an important role in the early detection and multidisciplinary medical management of complex autoimmune diseases. It is important to recognize prevalent medical and dental issues and special needs of patients with autoimmune conditions.

**Decoding the Neonatal Oral Cavity: An Overview of the Common Lesions and their Management**

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**Background:** The oral cavity of a pediatric patient is an arena that can present with a plethora of varied lesions. Even though they present in the oral cavity, these multifaceted lesions can indicate the presence of underlying systemic conditions. The oral cavity of a neonate is no different, but the presence of such lesions

, triggers panic and fear among the parents and even health care providers, who are unaware of these deviations from the normal development. Though some of these lesions commonly resolve without any intervention, the lack of professional expertise and parental education might lead to a misdiagnosis followed by inappropriate management.

**Literature review:** According to a review article by Patil S et al (2016), the common oral cystic lesions observed in neonates are Epstein pearls, Bohn's nodules, Eruption cysts and Epidermoid and Dermoid cysts. Though the Gingival/Dental lamina cyst of Neonates, Epstein pearls, and Bohn's nodules usually self-resolute, the Eruption cysts and the Epidermoid and Dermoid cysts might require invasive treatment at times, mostly depending on the difficulties that they cause.

**Conclusion:** Neonates presenting with intraoral lesions mandates accurate diagnosis, prompt management, along with parental reassurances and counseling. Therefore, a thorough clinical evaluation equipped with substantial knowledge is essential in diagnosing and managing all such easily recognizable as well as rare abnormalities affecting the oral tissues in neonates. Thus, this poster tries to throw light on the different oral lesions in neonates and thereby help the clinicians understand and manage them better.

**"A Transplant Journey"**Sneha Desai

**Background:** Oral squamous cell carcinomas (OCC) are rare among children and young adults. Since early 1990, a series of studies reported that the most common secondary malignancies, including leukemia, lymphomas, and solid tumors, occurred in patients undergoing hematopoietic stem cell transplantation (HSCT), especially patients after allo-SCT.

**Literature review:** Montebugnoli et al., stated that several cases of oral SCC in children and young adults were incidences of secondary cancer associated with transplantation for leukemia and other malignant diseases. A higher incidence of oral squamous cell carcinoma has been reported in patients experiencing chronic graft versus host disease secondary to hematopoietic stem cell transplant. HSCT patients have a significantly higher risk of developing secondary cancers than the general population with a more than 10-fold higher incidence of cancer of the oral cavity, esophagus and thyroid glands. The risk reaches its peak in children who are 10 years old at the time of transplantation and remains high in those who are 10–29 years old, while it decreases in those who are older than 30 years.

**Conclusion:** Despite its benefits, transplantation for childhood acute leukemia is controversial because of the risk of secondary malignancies. The development of secondary malignancies is a potential long-term complication after hematopoietic stem cell transplantation.



**Management of Pediatric Facial Cellulitis of Odontogenic Origin**

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**Introduction:** Cellulitis is an infection of the cellular adipose tissue located in the aponeurotic spaces. It can be classified on the basis of location, severity and evolution. It is a real emergency in daily practice, because of the pain it causes and, especially, the speed with which they can appear. The purpose of this report is to present the particularities and management of cellulitis in children through case reports treated and followed in the pediatric dentistry department.

**Case report:** Case 1: An 8-year-old girl presented to the emergency with serous cellulitis related to 21. Treatment consisted of antibiotics until the swelling disappeared, followed by apexification treatment. Case 2: A 5-year-old child with leukemia consulted for suppurative cellulitis related to 85. Drainage was performed under sedation after medical treatment with regular follow-up for one month and extraction of the causal tooth. Case 3: A 10-year-old child consulted for chronic cellulitis related to 46. A CAO<sub>H2</sub> treatment was performed followed by an endodontic treatment with pediatric crown seal after apical healing.

**Discussion and conclusion:** Cellulitis of dental origin has specific features in children. They manifest themselves in different clinical and topographical aspects. The practitioner must recognize each of its forms in order to adapt his therapy according to the stage of the pathology, its localization and the general status of the child while ensuring a good clinical and radiological follow-up.

**Dental Sequelae of Radiotherapy Treatment of Solid Tumor in Childhood: Case Report**

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**Introduction:** Rhabdomyosarcoma is one of the most common solid tumors in childhood, usually treated by chemotherapy and radiotherapy. Radiotherapy in the head and neck region can have several side effects during therapy or years later. The aim of this study is to present a clinical case of a child treated at the dental outpatient clinic of a public university hospital (Brazil) that survived cancer.

**Case report:** A male child was referred to the dental service after ending an oncological treatment of parameningeal rhabdomyosarcoma, with chemotherapy and radiotherapy at the age of 3. He complained of dental pain and difficulty in adequate oral hygiene. The mother reported that the area of radiation was the ear. As a result of the tumor and treatment, the patient presented bilateral sinusopathy, radiation caries, difficulty on opening the mouth, atresia of the maxilla and numerous changes in the development of teeth (opacities, microdontia and no root formation of all maxillary permanent teeth). The treatment plan considered the adequacy of the oral environment, expansion of the maxilla and monitoring of pain and spaces for a future prosthetic rehabilitation.

**Discussion:** The late side effects of pediatric patients undergoing radiotherapy in the head and neck region have important dental implications, which vary according to the total dose, number of sessions, radiation field and the child's chronological and dental age.

**Conclusion:** The dentist as a member of the hospital's multidisciplinary team that is essential to maintain oral health in childhood cancer survivors during and after radiotherapy to the head and neck.

**Sequelae of Congenital Oropharyngeal Teratoma in the Oral Cavity of the Child: Case Report**

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**Introduction:** Oropharyngeal teratoma is a rare benign tumour originating from the skull base craniofacial structures, particularly the sphenoid, palatine and ethmoid bones, containing cells from endodermal, mesodermal and ectodermal layers. Teratoma occurs at a rate of 1:35,000 to 1:200,000 births. The purpose of the case report was to present the sequelae of congenital oropharyngeal teratoma in the oral cavity of the child and describe the clinical conduct.

**Case report:** A 2-years-old, female, referred by the otorhinolaryngologist for dental evaluation. The mother`s main complaint was that the child could not close her mouth. On clinical examination, the child presented macrostomy, absence of lip sealing, deep and atresic palate, incomplete cleft palate, microglossia, anterior open bite, dental crowding, agenesis of the lower lateral incisors, absence of caries lesions and enamel development defects. the child was referred to the geneticist to evaluate possible syndromic association and is under multiprofessional follow-up.

**Discussion:** Exact aetiopathogenesis of teratoma development is not known and may occur as an isolated abnormality or associated with other congenital abnormalities and shows a female predominance (female:male ratio- 3:1). The cleft palate is often reported in combination with the teratoma, and is caused by the formation of the tumour at a very early stage fetal life, between 8 and 12 weeks, before the normal union of the bilateral palatal.

**Conclusion:** Several sequelae were observed in the oral cavity and the need for periodic dental follow-up, which highlights the importance of pediatric dentistry in the multidisciplinary team in the post-excision follow-up of the teroma.

**Oral Health Care in Two Portuguese Pediatric Cancer Units: The Parents Experience**

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**Introduction:** Children with cancer have several side effects as result of cancer treatment. Oral complications are amongst the most frequent. Hence, oral care and the prevention of any infectious foci are essential, as the oral cavity has been recognized as one of the most common sources of sepsis, in these patients.

The objective of this study was to analyse clinical protocols in use at the Paediatric Oncology Unit, at the Centro Hospitalar Universitário São João (CHUSJ), Porto, Portugal, to prevent and manage most common oral complications in children and adolescents undergoing cancer therapy. Data from the parents' oral health knowledge was compared to data from a previous study at the Instituto Português de Oncologia do Porto, Francisco Gentil.

**Methods:** A cross-sectional observational study was performed to evaluate the literacy on oral health, as well as parents/caregivers knowledge about changes in the oral cavity, during cancer treatment. Questionnaires were applied to a convenience sample of parents/caregivers of children diagnosed with cancer, at the CHUSJ.

**Results:** Approximately 58% of the children included in this study had an initial consultation with a dentist before initiating cancer treatment and around 87% of the parents/caregivers were informed about possible oral complications. About 85% of the children had oral manifestations.

**Conclusions:** Oral health promotion practices could be improved in their scope and reach, at both cancer departments. Benefiting every patient with the best oral health care, would be mostly desirable, in order to improve their overall wellbeing and cancer therapy-related co-morbidities.

# ***Periodontal Disease in Children***

**Treatment of Premature Contact with Removable Appliance: A Case Report**

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**Introduction:** Premature contact, which is formed by the eruption of the teeth in mixed dentition, may cause permanent periodontal damage in the future. The aim of this case report is to describe the treatment of anterior crossbite and pathological mobility of the central incisor resulting premature contact using a modified removable appliance.

**Case Report:** A 9-year-old healthy female patient with mixed dentition presented to pedodontics clinic with the complaint of poor aesthetic appearance of maxillary incisors and mobility of a mandibular central incisor. The clinical examination revealed that the maxillary left central incisor (21) was in crossbite and that the mandibular left central incisor (31) had developed occlusal trauma and Miller class II mobility due to premature contact. A removable occlusal acrylic appliance was designed that incorporated a labiolingual spring at the palatal side of the central incisor (21). The spring was activated by follow-ups with 1-week intervals. At the end of the 2nd week, the patient had an ideal overjet-overbite relationship. After one month of follow-up, it was observed that the mobility of lower left central incisor was within physiological limits.

**Discussion:** The advantage of using modified removable appliances in the treatment of premature contact is the short duration of the treatment. Disadvantages include requiring patient cooperation and motivation, and reduced comfort.

**Conclusion:** Pediatric dentists and clinicians should be aware that tooth eruption disorders and premature contact can cause occlusal trauma and periodontal diseases and should take early precautions with modified removable appliances to prevent permanent periodontal damage.

**Oil Rinsing on Total Antioxidant Capacity of Saliva in Children- A Comparative Study**

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**Background:** The changes in salivary composition, physical and chemical properties can be brought about by chemical plaque control measures. Oil rinsing or Oil pulling is an ancient procedure of gargling the mouth with certain oils. Very few studies have ascertained the health benefits of oil rinsing in comparison with commonly used chemotherapeutic agents .

**Methods:** 80 children in age group of 12 - 14 years with mild to moderate gingivitis were selected and grouped into 4 groups and advised to do chlorhexidine gargling, oil rinsing with sesame oil and virgin coconut oil, for a period of one month. Unstimulated whole saliva, was collected from these subjects and evaluated for total antioxidant capacity, at three distinct time interval – at baseline , at 15th day and 30th day. The data were tabulated and statistical analysis were done using ANOVA (post – hoc) , followed by Dunnet –t test

**Results:** The salivary total antioxidant capacity was increased on oil rinsing . On intra group comparison, since p value 0.05, there was a significant change within the groups at baseline, 15th day and 30th day. Maximum change in total antioxidant capacity was seen on chlorhexidine gargling and oil rinsing with virgin coconut oil followed by oil rinsing with sesame oil and the least on rinsing with plain water .

**Conclusions:** Virgin coconut oil rinsing has equal effectiveness as chlorhexidine on antioxidant capacity of saliva .

### **Short Term Effectiveness of Supervised use of Magnetized Water Mouth Rinse for Plaque and Gingivitis Inhibition in Children**

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**Background:** Chlorhexidine mouth rinse a 'Gold Standard' is effective in reducing plaque and gingivitis, has some drawbacks like bitter taste, light-brown staining of teeth etc. which limits its long-term use. Magnetized water is alkaline (pH as high as 9.2) and it inhibits the bonding process between plaque and teeth by "magnetohydrodynamics". The purpose of the study was to compare the effectiveness of magnetized water and 0.2% chlorhexidine for plaque and gingivitis inhibition.

**Methods:** This double blinded randomized control clinical study was carried out at a non-government high school. A total of 20 children aged 12-15 years were randomized into two groups, magnetized water and 0.2% chlorhexidine mouthwash, each comprising of 10 children who were asked to rinse with the respective mouthwash. Plaque score and gingival scores were evaluated at baseline, 2 and 3 weeks.

**Results:** In the present study,  $p < 0.05$  was considered as level of significance. Intra group comparison showed a statistically significant difference ( $p = 0.0001$ ) in reduction of the mean Plaque index (PI) and Gingival Index (GI) scores of magnetized water and Chlorhexidine, both at 2 and 3 weeks with no adverse effects. Intergroup comparison showed a statistically significant difference only in mean reduction of gingival index score at 3rd week in favour of chlorhexidine ( $t = 2.99$ ,  $p = 0.08$ ).

**Conclusions:** Daily short-term supervised use of magnetized water was safe and showed statistically significant reduction in plaque and gingival scores at 2 and 3 week compared to baseline. Chlorhexidine showed statistically significant greater reduction in gingival index score than magnetized water at 3 weeks.



**Prevalence of Gingivitis among Children and Adolescents in Belarus**

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**Background:** Gingivitis is the most prevalent periodontal disease among teenagers. In some countries this pathology is registered in 83-100% of 15 year old adolescents.

The purpose of the present study is to analyze the prevalence and distribution of gingivitis in children and adolescents in the Gomel region of Belarus.

**Methods:** Gingival data from 360 children were obtained. 180 children in each of the age groups of 12 and 15 years from urban (60 boys and 60 girls) and rural (30 boys and 30 girls) areas, constituted the material. All data were analyzed using the Statistica 10.0 software suite.

**Results:** The prevalence of gingivitis was 66% in 12-year-olds and 47% in 15-years-olds. The lowest prevalence (43%) indicated in urban adolescents of 15 years and the highest (72%) in rural 12-year-olds ( $p < 0.01$ ). The prevalence of gingivitis was significantly lower among girls,  $p < 0.01$ .

The mean GI was 0.60 in urban 12-year-olds and 0.87 in rural children ( $p < 0.01$ ). The mean GI was 0.56 in urban 15-year-olds and 0.68 in rural adolescents ( $p = 0.01$ ). Mild gingival inflammation was diagnosed in 68% and 61% children living in cities. Moderate inflammation of gingiva was found in 55% of 12-year-olds and 50% of 15-year-olds in the rural area. The mean PLI was 0.70 and 0.66 respectively in urban children and 1.01 and 0.73 in rural adolescents.

**Conclusion:** The prevalence of gingivitis was higher in children of 12 years than of 15 years old and in the rural area. The intensity of gingival inflammation was higher in boys and correlated with bad oral hygiene.

## Early Markers of Periodontal Disease and Altered Oral Microbiota are Associated with Glycemic Control in Children with Type 1 Diabetes

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**Background:** To determine the relationship between periodontal disease and glycemic control in children with type 1 diabetes and to characterize the diversity and composition of their oral microbiota.

**Methods:** Cross-sectional study of children with type 1 diabetes recruited from clinics at the Women's and Children's Hospital (Australia). Participants had a comprehensive dental assessment, periodontal examination, and buccal and gingival samples collected for 16S rRNA sequencing.

**Results:** Seventy-seven participants (age  $13.3 \pm 2.6$  years, 38 males, BMI z-score  $0.81 \pm 0.75$ ) with a diabetes duration of  $5.6 \pm 3.9$  years and median HbA1c of 8.5% (range 5.8–13.3), 69.4 mmol/mol (range 39.9–121.9) participated in the study. Thirty-eight (49%) had early markers of periodontal disease. HbA1c was positively correlated with plaque index (Rho=.34, p=.002), gingival index (Rho=.30, p=.009), bleeding on probing (Rho=.44, p=.0001) and periodontal pocket depth of 3 mm (Rho=.21, p=.06). A 1% increase in HbA1c was independently associated with an average increase in bleeding on probing of 25% (p=.002) and with an increase in the rate of sites with pocket depth of 3 mm of 54% (p=.003). Higher HbA1c was independently related to increased phylogenetic alpha diversity (p=.008) and increased compositional variation (beta diversity p=.02) in gingival, but not buccal, microbiota. Brushing frequency, plaque index, and gingival index had a significant effect on microbiota composition, independent of HbA1c.

**Conclusions:** Children with type 1 diabetes showed a relationship between less favorable glycemic control and increased early markers of periodontal disease. Glycemic control was also related to the complexity and richness of the plaque microbiota, with diversity increasing as HbA1c levels increase.

**Excision of Ulcerated Gingival Growth using Laser and Orthodontic Extrusion of the Dilacerated Permanent Central Incisor: Case Report**

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**Introduction:** Among the many developmental anomalies, dilacerated tooth is particularly disturbance in eruption and one of the causes of delay eruption in developing dentition. And is one of the most concern esthetic problem in upper anterior region. Management of dilacerated maxillary central incisor needs multidisciplinary approach.

**Case report:** The present case report describes the application of the diode laser in ulcerated gingival growth and orthodontic extrusion of the buccally erupted dilacerated permanent central incisor. The dilacerated tooth well aligned 4 months after excision and extrusion orthodontically.

**Discussion:** Teeth with dilacerated crowns erupted buccally displaced and associated with ulcerated growth. In this case report, dilaceration is at the crown and root junction and the prominence of root tip can be palpable but not exposed. The laser in addition to basic principles are required in paediatric dental practice which provides less traumatic experience in stress free environment.

**Conclusion:** Diode laser provides an effective, rapid, simple, bloodless and well accepted procedure in paediatric patients. In addition, minimal post operated discomfort and scarring was reported. The dilacerated tooth properly aligned in the arch without the further endodontic treatment and apicectomy procedure.

**Implications in the Use of Systematic Desensitization and Electric Toothbrushes in the Control of Bacterial Plaque. Case Report**

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**Introduction:** Gingivitis is highly prevalent among Chilean children. The removal of biofilm and calculus by the dentist, can be uncomfortable for the pediatric patient, there are different to management techniques, including adaptive techniques, such as systematic desensitization and the use of general anesthesia. Education on hygiene methods is essential to maintain the results of the treatment at home, accompanied by hygiene elements such as manual or electric toothbrushes and dental floss. The purpose is to present how progressive desensitization and the use of an electric toothbrush contributed to restore oral health to the patient.

**Case Report:** After informed consent, this 9-year-old patient, who was referred to our clinic for dental cleaning under general anesthesia was treated instead with systematic desensitization. Initially, generalized bacterial deposits and caries were seen. Gingival and rehabilitative treatment was performed, but during a posterior control no progress was shown. Manual toothbrush was replaced by an electric one, changing gingival health.

**Discussion:** The use of progressive desensitization as an adaptation technique contributed to the conventional care of the patient without having to resort for general anesthesia. Furthermore, the use of electric toothbrush according to the literature helps for a better control of biofilm and gingivitis compared to the manual one, but studies are still inconclusive.

**Conclusion:** In this case, systematic desensitization was the best resource considering the cost benefit in relation to general anesthesia. The transition from manual to electric toothbrush demonstrated improvements in biofilm control.

**Factitious Injury Presented as an Indiscriminate Red Patch in a Young Child: A Case Report**

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**Introduction:** Self-injury to the gingiva is a rare but serious finding amongst children and adolescents. The most common cause is picking/scratching of the gingiva using fingernails. These lesions are far more common in children compared to adults.

**Case Report:** A 3-year-old, medically unremarkable girl was referred by her General Dental Practitioner to the Paediatric Department, University Dental Hospital of Manchester regarding a red patch around her maxillary deciduous incisor gingivae. The accompanying parent was unsure of the duration the lesion had been present. The patient did not describe any symptoms and there was no history of dental trauma. The URA and ULA presented with 3mm gingival recession [DM(MUNF1)] but were otherwise unremarkable. The labial gingivae showed several marks characteristic of fingernail induced self-injury. Both the parent and child were re-assured, and advice was provided to break the habit. An intensive oral hygiene routine was implemented, and close follow-up planned.

**Discussion:** This case highlights the importance of considering factitious injury as a differential diagnosis of localised soft tissue lesions that may present with an initially challenging clinical picture. Follow-up is required to monitor progression and consider further investigations if the clinical presentation changes. A complete clinical and social history is necessary for a comprehensive assessment.

**Conclusion:** Habit breaking techniques are often effective in the cessation of self-injurious habits. If they are recognised and stopped early, the child can be prevented from causing extensive gingival and periodontal damage and subsequently having to undergo potential non-surgical and surgical periodontal therapy in later life.

## **Gingival Health Status of 11-12 year old Primary School Children in a Rural Community in Southeast Nigeria**

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**Background:** Gingivitis of varying severity is a common oral disease in children and adolescents. The purpose of this study is to assess the gingival health status of 11-12 year old primary school children in a rural community in south -east Nigeria

**Methods:** A cross sectional descriptive study of 11-12 year old primary school children was done in a public primary school in Nkanu -West local Government Area of Enugu State. Ethical clearance for this study was sought and obtained. Sample size was calculated and socio-demographic data was obtained using interviewer-administered questionnaire. Gingival examination was done by a single examiner ( $k= 0.76$ ). Intra examiner calibration (five children per session) was done prior to data collection, The gingival status was assessed according to the gingival index of Loe and Silness. Statistical analysis was done using SPSS Version 20. P values 0.05 were accepted as being statistically significant

**Results:** Twenty one (42 %) females and twenty nine (58%) males were seen and examined, giving a female to male ratio of about 1:1.4. Of the examined children, 39(78 %) had mild gingivitis, 9(18 %) had moderate gingivitis while 2(4 %) had normal gingiva. None of the school children had severe gingivitis. Mild gingivitis was seen more in females than males, while moderate gingivitis was seen more in males than females. 96% of the school children brush their teeth once daily, using the horizontal scrub technique.

**Conclusions:** In this study, 4% of the primary school children had normal gingival and none of the school children had severe gingivitis

### **Creating Right "Pink to White" Proportion for Optimizing Functional & Esthetic Harmony; Report of a Surgical Case**

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**Introduction:** The overall balance of pink and white is important in terms of Esthetics in dentistry. Recently emphasis is also laid on pink proportion of gums, which not only affects the appearance of an individual, but also affects mastication. Cases of Gingival enlargement due to anticonvulsant drugs, pose a challenge to a clinician in maintaining the perfect blend of white and pink. The present case report describes the treatment of a young girl with a 100% gingival overgrowth covering her dentition completely that was treated effectively and efficiently in a step-wise manner.

**Case report:** A 7-year old female child reported to the department of Paediatric and Preventive Dentistry, with the chief complaint of submerged teeth. Extra-oral appearance seemed bulky and she had difficulty in closing her mouth. Medical History revealed that she was on anticonvulsants for the last 5 years. Intra-oral examination showed Grade 3 gingival enlargement and all her teeth were submerged in the swollen gingivae. After consulting the physician, a gingivectomy with electrocautery was planned in a sequential manner, along with substitution of drugs and oral health maintenance.

**Discussion:** Gingival overgrowth is not only disfiguring, but it also interferes with speech and mastication, thus it is essential to have a thorough knowledge of the disease. The surgical management of such tissues plays an important role in life of an individual. Lasers and electrocautery are the new modalities, with less patient discomfort and time.

**Conclusion:** In the present case a complete reversal and appropriate balance of pink and white was achieved with surgical management.

**Dental Biofilm Induced Gingival Disease in a Pediatric Patient: Case Report**

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**Introduction:** Gingivitis is the reversible inflammation of the gum, caused by accumulation of biofilm, made up of gram negative bacteria such as Porphyromonas Gingivalis, Prevotella Gingivallis, etc. The loss of the clinical crown due to caries causes food impaction as a predisposing mechanical factor for periodontal disease. This work illustrates the treatment of biofilm-induced gingivitis in a pediatric patient.

**Case report:** 9.3-year-old female patient, without medical issues, presented with tooth pain in the lower left region. Carious lesion is observed in OD 36-ICDAS-5 and OD 75, 55,65 about to exfoliate, covered by biofilm, halitosis, hypertrophic inflammation with outflow of purulent material from the vestibular at OD 36 level. Radiographically there were no pathological changes. The treatment consisted of pulpotomy of OD 36 with Ca (OH)<sub>2</sub> and propylene glycol covered by MRI and extraction of OD 75, 55 and 65. The patient was instructed to control dental biofilm, and use of chlorhexidine gluconate 0.12 % 5 ml 3 times a day for 10 days. Gingival health was achieved and a preformed crown was placed on OD 36.

**Discussion:** Pain during brushing increases the risk of periodontal disease. Chlorhexidine 0.12% is recommended for its antiseptic, bactericidal, affinity, low toxicity, and residual action of 6hrs. Its disadvantage is pigmentation in prolonged use.

**Conclusion:** The use of mechanical and antimicrobial measures (0.12% Chlorhexidine) achieved gingival health in two weeks in the patient.



**Periodontal Health Status of Children and Adolescents with Diabetes Mellitus: A Systematic Review**

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**Background:** There is a bidirectional connection between diabetes mellitus and periodontitis. Given this reality, this review focus on children and adolescent with diabetes mellitus to measure the proof of periodontal wellbeing in them.

**Literature review:** Type 1 diabetes mellitus (T1DM) is due to autoimmune  $\beta$  cell destruction in pancreas thus seen as insulin deficiency, whereas type 2 diabetes mellitus (T2DM) is due to defect on insulin molecule or altered insulin receptor leading to insulin resistance. Both diseases occur in children and this denies the traditional paradigm claiming that T1DM only occurs in children and on the other hand T2DM happens in adults only.

Diabetic children can present with many changes in the oral ecosystem. Apart from experiencing teeth eruption at an earlier age, children with DM also presented with more gingivitis compared to the non-diabetic children with a higher rate of gingival bleeding and risk of developing the initial stage of periodontal diseases.

**Conclusion:** Moderate proof was comprehended through the listed literature to support for the advancement of periodontal disease in children with diabetes mellitus.

**Associations between Alimentary Factors and Periodontal Status among Adolescents in an Arctic Russian Region**

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**Background:** Heterogeneity of findings on the associations between nutritional factors and oral health warrants studies in different settings and age-groups. We assessed associations between the WHO-selected dietary factors and periodontal inflammatory diseases (PID) among 15-year-old adolescents in Arkhangelsk region.

**Methods:** A cross-sectional study was performed in 7 urban and 5 rural settings. Altogether, 1172 15-year-olds were examined using standard WHO methodology. Associations between dietary factors and the average number of affected sextants were studied using multivariable Poisson regression.

**Results:** The prevalence of PID was 50% (95% CI: 47.1-52.9). The number of affected sextants varied from 0 to 6 (Mean=1.41). The prevalence of bleeding and calculus was 47.0% (95% CI: 44.1-49.9) and 23.4% (95%: 91.0-25.9), respectively. Positive associations were observed between the frequency of consumptions of soft drinks ( $p=0.009$ ) and tea / coffee with milk and the number of affected sextants ( $p=0.037$ ). This number was 32% lower among those who consumed chewing gum daily or more often compared to the reference group. Inverse associations between the number of affected sextants and the frequency of chewing gum consumption ( $p=0.020$ ) and fresh fruits ( $p0.001$ ) were also found.

**Conclusions:** More frequent consumption of chewing gum was associated with lower prevalence of bleeding and lower average number of affected sextants. More frequent consumption of soft drinks was associated with greater average number of sextants with bleeding. Higher consumption of fresh fruits and chewing gum was associated with lower prevalence of PID and lower average number of sextants with calculus.

Education in Paediatric Dentistry, Endodontics, Periodontal Disease in Children, Restorative Dentistry

### **Oral Rehabilitation in a Pediatric Patient with Malnutrition: A Case Report**

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**Introduction:** Malnutrition refers to an imbalance between the nutrient supply and the body's demand to guarantee tissue growth. This alteration results in generalized tissue hypotrophy due to lack of nutrients, which leads to oral cavity repercussions, such as a decreased buffer capacity of saliva that triggers dental caries.

**Case report:** A four-year-old male patient, whose diagnosis is Early Childhood Caries, presented with abscesses and generalized gingivitis. After obtaining an adequate medical history and signed informed consent from his parents, a comprehensive rehabilitation, including pulpal and restorative treatments, was planned. Results of a 1-year follow-up will be presented.

**Discussion:** The aim of comprehensive oral rehabilitation in pediatric patients is to preserve the integrity of primary dentition in order to: avoid delays in the patient's growth and development, prevent malocclusion, reduce harmful habits, prevent psychological sequelae, and improve cognitive development, phonation and mastication.

**Conclusion:** Oral rehabilitation of pediatric patients with systemic compromise and Early Childhood Caries can restore their quality of life and improve their psychosocial well-being.

***Preventive and  
Interceptive  
Orthodontics***

### **Assessment of the Association between Sleep Disordered Breathing (SDB) and Developing Malocclusion in 6-12-year-old Children – A Cross-sectional Study**

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**Background:** Children have a varied presentation of SDB from snoring and frequent arousals to enuresis and hyperactivity. Untreated SDB may result in complications such as learning difficulties, memory loss, hypertension, depression as also poor orofacial development and malocclusion.

**Methods:** One hundred and seventy-seven, healthy children aged 6-12 years were assessed for malocclusion and their parents were administered a pre-validated questionnaire for assessing SDB by a single, calibrated examiner. The questionnaire had 4 domains, related to snoring, SDB, daytime sleepiness, and daytime behavior problems. The primary variables assessed were SDB (Pediatric Sleep Questionnaire) as a binary variable and developing malocclusion (IOTN score and Angle's classification) and the modifying variables assessed were age, gender, and tonsillar enlargement (Brodsky's criteria) to see their effect on the association.

**Results:** The prevalence of SDB was 69%. Angle's Class II and Class III molar relation was more significantly associated with SDB ( $\chi^2 = 9.475$ ,  $p < 0.05$ ). SDB was more significantly associated with IOTN grade 4. ( $\chi^2 = 109.799$ ,  $p < 0.05$ ). Girls had a higher prevalence of SDB (57.27%) and tonsillar enlargement (+3 score of Brodsky's criteria) had a significant effect on the association ( $p < 0.05$ ). Age did not have any modifying effect on the association.

**Conclusions:** SDB had a significant association with developing malocclusion. Children having Angle's Class II and Class III molar relation showed a higher prevalence of SDB. Children with SDB showed higher grades of orthodontic treatment needs.

**Treatment of Premature Contact with Removable Appliance: A Case Report**

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**Introduction:** Premature contact, which is formed by the eruption of the teeth in mixed dentition, may cause permanent periodontal damage in the future. The aim of this case report is to describe the treatment of anterior crossbite and pathological mobility of the central incisor resulting premature contact using a modified removable appliance.

**Case Report:** A 9-year-old healthy female patient with mixed dentition presented to pedodontics clinic with the complaint of poor aesthetic appearance of maxillary incisors and mobility of a mandibular central incisor. The clinical examination revealed that the maxillary left central incisor (21) was in crossbite and that the mandibular left central incisor (31) had developed occlusal trauma and Miller class II mobility due to premature contact. A removable occlusal acrylic appliance was designed that incorporated a labiolingual spring at the palatal side of the central incisor (21). The spring was activated by follow-ups with 1-week intervals. At the end of the 2nd week, the patient had an ideal overjet-overbite relationship. After one month of follow-up, it was observed that the mobility of lower left central incisor was within physiological limits.

**Discussion:** The advantage of using modified removable appliances in the treatment of premature contact is the short duration of the treatment. Disadvantages include requiring patient cooperation and motivation, and reduced comfort.

**Conclusion:** Pediatric dentists and clinicians should be aware that tooth eruption disorders and premature contact can cause occlusal trauma and periodontal diseases and should take early precautions with modified removable appliances to prevent permanent periodontal damage.

Dental Anomalies, Preventive and Interceptive Orthodontics

### **Multidisciplinary Management of Amelogenesis Imperfecta with Class III Malocclusion in a 9-year old Child**

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**Introduction:** Amelogenesis Imperfecta is a rare dental anomaly characterized by defective enamel formation. Management of this rare, inherited disorder includes preventive and esthetic restoration of affected teeth. If the condition is associated with skeletal malocclusion it can get complicated. The aim of this case report was to present the multidisciplinary management of Amelogenesis Imperfecta with Class III malocclusion in a 9-year old child.

**Case Report:** An oral examination of a 9-year old female revealed yellowish discoloration and short, deformed crowns of teeth. Multiple deciduous and permanent teeth were affected by Amelogenesis Imperfecta. The patient also had molar Class III malocclusion and anterior crossbite. Cephalometric analysis showed a skeletal Class III relationship with maxillary hypoplasia and normal mandibular position. Preventive and restorative treatment including pit and fissure sealants, fluoride treatment, composite and resin-modified glass ionomer cement restorations, and stainless steel crowns were rendered. To correct Class III skeletal malocclusion, orthopedic treatment with rapid maxillary expansion and protraction facemask therapy was instituted.

**Discussion:** The treatment was aimed to provide a stable, functional occlusion and a pleasing smile to the patient. Slight to moderate loss of tooth structure was managed with tooth-colored restorations. Stainless steel crowns were placed on permanent molars to allow normal growth to occur. Amelogenesis Imperfecta with Class III malocclusion has an overwhelming psychological impact. Protraction facemask therapy has been known to provide positive treatment outcomes.

**Conclusion:** Early intervention of these conditions improves function and facial esthetics, and prevents further damage of teeth, bone, and soft tissues.

## **Parental Responses about Sleep Disordered Breathing and its Association with Mouth Breathing in their Children: A Questionnaire-Based Study**

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**Background:** Sleep disordered breathing (SDB) influences the child's quality of life and causes several problems such as growth problems, behaviour problems and orthodontic problems in children. It may go undetected by the parents due their unawareness about the SDB leading to mouth breathing in children. Therefore, present study was conducted with the aim to evaluate the parental responses about SDB and its association with mouth breathing in their children.

**Methods:** A structured questionnaire consisting of 10 questions was framed. Out of 110 children, 30 parents who responded to questionnaire-based study were included after obtaining their consent. After obtaining their responses, all the questions were evaluated to understand the parental responses to associate their knowledge about sleep disordered breathing of their children with the presence of mouth breathing in their children. Chi square test was used as the study consisted of qualitative questions.

**Results:** Responses in order of chronological sequence received from parents for their children were: Child feels thirsty [25(83.33%)], strange position of child during sleep [24(80%)], child struggles to breathe [16(53.33%)], child feels dry mouth on waking [(14(46.66%)), child has upper respiratory tract infections [6(20%)], child unusually sleepy during day time [5(16.66%)], child appears to be more hyperactive [5(16.66%)]. Other less common responses were related to restless sleep of child and snoring.

**Conclusions:** After obtaining and evaluating parental responses for its association with mouth breathing in children, further it can be correlated with clinical predictors to confirm the mouth breathing habit in their children.



**Clinical Application of 3 D Printed Space Maintainer: A Digital Transformation.**

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**Introduction:** Band and loop Space Maintainers (SM) are indicated for the premature loss of single primary molar. Digital technology decreases the human errors utilising 3-D printing. The current case report provides an insight and use of this technology to manufacture space maintainer.

**Case Report:** In a 7-year-old male child, reported with deep proximal caries with 74 (FDI Notation) and coronal radiolucency involving enamel, dentine, pulp, and extending to the furcal region, with loss of 2/3rd of the root length seen in the IOPAR. Post extraction and analysis, a space deficit of 1.8mm was detected. The retrieved cast after impressions, was scanned, a digital design of the SM was made, and was 3D printed with a metal-based material. The SM was tried in the patient's oral cavity and after confirming its adaptation; it was cemented using glass ionomer cement. The patient was recalled after 3 months.

**Discussion:** Failure in maintaining the space may lead to the collapse of vertical and horizontal occlusal relationships in primary and permanent dentitions. The whole process of digitalising impression, designing, and printing the SM by 3-D printer increases the precision of the appliance, minimising human error, and saves time chair-side. Also, the appliance is printed as one unit minimising the breakage thus, reducing failure of the appliance.

**Conclusion:** The presented innovative digital design of 3-D printed SM is precise, quick, and easy. Development and perfection of 3-D printing technology allows a production of information in three dimensions with accuracy.

**The Treatment of Tooth Loss and Its Psychological Effect on Children: One Case Report**

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**Introduction:** Early tooth loss caused by various reasons in children can lead to various problems such as function, aesthetics and phonation as well as psychological problems. Restoring the function and aesthetics increase the living standards of children as it also helps to improve the children's self-confidence and self-esteem. Various treatment protocols are applied to treat this case. The case aim was to apply a prosthesis in 5.5 years old child with multiple teeth loss.

**Case Report:** A 5.5-year-old girl who could not chew due to multiple teeth deficiency and suffer from loss of self-confidence was referred to our clinic. After the examination, it was determined that the teeth numbered 54,53,52,51,61,62,64 in the upper jaw and the teeth numbered 74,75,84,85 in the lower jaw were lost prematurely due to caries. The impression was taken with irreversible hydrocolloid material and the prosthesis was planned. After the rehearsals and controls that lasted for about two weeks, the prosthesis was adapted in the mouth. It was observed that the patient had no problems at the 6-month follow-up.

**Discussion:** In this case, rehabilitation of many missing teeth with prosthesis has been an advantageous treatment option compared to other treatment options for ensure the lost function and self-confidence of children. The difficulty of using the prostheses of children is considered as a disadvantage of this treatment option.

**Conclusion:** Prostheses applied in multiple tooth deficiencies in children were found aesthetically and functionally successful. In addition, it has been seen that aesthetic treatments affect pediatric patients' psychology positively.

**Association between Sella Turcica Bridging and Impacted Maxillary Canines**

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**Background:** Changes in sella turcica (ST) development may be associated with the impaction of the permanent canine teeth. The aim of this study was to evaluate if there is an association between ST bridging and the presence of impacted maxillary canines (IMC).

**Methods:** In this case-control study, two blindly and calibrated examiners, through cephalometric radiographs, measured the length, diameter and depth of the ST, and levels of calcification were established. Sixty-four patients were divided into a case group - with IMC (n = 32), and a control group - without IMC (n = 32). Comparison of ST dimensions between groups was carried out by t test, whereas the association of ST bridging with the case group was analyzed by chi-square test. The strength of the association between ST bridging and the case group was estimated by the odds ratio.

**Results:** The case group have a shorter ST length (P = 0.042), which is reduced in males (P = 0.038). ST bridging frequency is higher in case group (P = 0.03) and gender does not have an influence. The odds ratio of having ST bridging between cases was 5.92 times higher than in the control group.

**Conclusions:** It can be concluded that patients with IMC have shorter interclinoidal distance, which is reduced in males. ST bridging can be considered as a diagnostic tool to evaluate canine impaction.

## Evaluation of the Efficacy of RURS Elbow Guard - An Innovative Extra Oral Appliance to Prevent Thumb Sucking Habit in Children

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**Background:** Thumb sucking is a common oral habit among children which, if continued over an extensive period, can result in the development of malocclusion. The purpose of this study was to evaluate and compare the efficacy of RURS elbow guard (REG) on thumb-sucking habit in children with and without intellectual disability.

**Methods:** Children with and without intellectual disability having thumb-sucking habit were identified. Children who did not stop the habit after psychological counseling and preventive therapy were included in the study. Group I consisted of 45 thumb-sucking children without intellectual disability who were treated with fixed intraoral crib appliance. Group II consisted of 45 thumb-sucking children without intellectual disability who were treated with REG. Group III consisted of 45 thumb-sucking children with intellectual disability who were treated with REG.

**Results:** Children treated with REG had good compliance when compared to the intraoral crib. The mean duration and standard deviation (S.D.) of appliance therapy for Group I was 200.2 ±20.43 days. Mean duration and S.D. for Group II was 204.3 ±20.56 days. Group III had the highest mean treatment duration of 218.4 days (± 15.66 days). Statistically, significant differences were seen between Group I and Group III (p=0.001) and between Group II and Group III (p0.05).

**Conclusions:** RURS elbow guard may provide an alternative to intra-oral habit breaking appliance therapy for thumb-sucking children without intellectual disability, and can be effective in the treatment of thumb-sucking in children with mild and moderate intellectual disability.

**Dominant Predisposing Factors for the Early Malocclusion Development: Genetics or Acquired Causes?**

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**Background:** Malocclusion in children is a multifactor disorder that was not a major problem in the past. Due to the growing interest in this topic it is important to identify potential predisposing factors for the development of an early malocclusion to elaborate on the proper correction plan. This study aimed to statistically determine the prevalence of genetic or acquired causes of paediatric malocclusion.

**Methods:** A primary dentition study was conducted in the Moscow area at ages 3-6 years (N = 1014). The types of genetic and acquired predisposing factors were recorded according to the legal representative's questionnaire. Orthodontic parameters, such as open or deep bite (OB), crossbite, overjet (OJ), midline deviation, anterior crowding, and moderate/severe malocclusion (MSM), were assessed during the oral examination and analysed. Variation statistical analysis was conducted for the determination of hereditary characteristics and bad oral habits according to the questionnaire and the examination.

**Results:** Orthodontically compromised genetics trended significantly lower as a predisposing factor for paediatric malocclusion (total 86,5%, including 92% girls and 81% boys) than acquired causes (total 89,5%). Most acquired factors were represented by bad oral habits – prolonged sucking (807 children - 80%), mouth breathing (756 children - 75%), soft diet (749 children - 74%), foreign objects biting (497 children - 49%), lip-biting/licking (209 children - 21%), others (tongue thrust, etc.).

**Conclusion:** There is an extreme need for the practitioners to figure out the dominant predisposing factors of the early malocclusion to adjust the treatment plan accordingly, focusing primarily on bad oral habits.

## **Cephalometric Evaluation of the Thickness of the Soft Palate and Adenoid Size as an Indicator for Development of Obstructive Sleep Apnea in Children with Mouth Breathing Habit**

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**Background:** the present study aimed to assess the thickness of soft palate and adenoid size using lateral cephalometric radiographs in children with mouth breathing habit, as an indicator for the development of obstructive sleep apnea(OSA).

**Methods:** 40 children in the age group of 6-12 years reporting to the department of pedodontics, People Tree Hospitals, Bengaluru were included in the study. The study subjects were divided into 2 groups.

Group 1: 20 children with mouth breathing habit

Group 2: 20 children without mouth breathing habit

Lateral cephalograms were taken and linear measurements were made to assess the thickness of soft palate and adenoid size. The adenoidal-nasopharyngeal ratio (A/N) was measured on lateral radiograph according to the method by Fujioka et al.

**Results:** The length and the thickness of the soft palate was increased in subjects with mouth breathing habits. The A/N ratio was also statistically significant in mouth breathing patients as compared to controls.

**Conclusions:** Soft palate evaluation and adenoid size may be an indicator of the development of Obstructive Sleep Apnea in children at later stages.

**Permanent Second Molar Uprighting: A Case Report**

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**Introduction:** Dental impaction is the cessation of the eruption, caused by: presence of a physical obstacle in the eruption process, abnormal position of the teeth or idiopathic, which often occurs unexpected for the dentist . Impaction of the second permanent molar (2M) has a low incidence (0.15% to 1.4%), occurring more frequently unilaterally, mandibularly, and on the left side. The objective of the correction is to avoid caries, periodontal, endodontic, occlusion problems and the reabsorption of the adjacent tooth. Corrective treatments can be orthodontic, surgical, or both.

**Case Report:** The case of a 9-year-old girl with dental impaction on tooth 37 was confirmed by clinical and radiographic examination. The patient is under hormonal therapy for precocious puberty.

**Discussion:** We chose to straighten its axis of eruption using a Haltermann device, which is easy to make, because of its similarity to a handle and band and loop space maintainer, and after three weeks the second molar was uprighted.. Currently there are many efficient devices for uprighting second molars, however, often with more complex handling and higher cost.

**Conclusion:** It is very important for dentists to be aware of this condition, since early detection and intervention with a simple method can help prevent many harmful complications.

**Treatment of Anterior Open Bite and Jaw Atresia during Mixed Dentition: Clinical Case Report**

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**Introduction:** The effectiveness of the treatment of open bites occurs with the detection and intervention with interceptive orthodontic appliances at the earliest possible stage. The success of the treatment occurs through changes in transversal measures of the maxilla and redirection of bone growth. Keeping spaces of primary teeth lost early are also timely and necessary interventions for the conservation of the perimeter of the dental arch.

**Case Report:** A clinical case of anterior open bite associated with maxillary atresia treated during mixed dentition will be presented. The patient was 8 years and 10 months old at the beginning of treatment, when she was referred to the Preventive Orthodontics discipline at FORP-USP. In the initial clinical and cephalometric examination, a class III molar relationship was observed, left subdivision, due to extensive caries in tooth 75 with mesial migration of 36; atypical swallowing habit, anterior open bite (-3mm); early loss of 84; 4mm overjet; mixed breathing; deep palate; vestibularized lower incisors and the upper ones verticalized. A MacNamara circuit breaker with a vertical grid in the upper arch and a lower lingual arch was indicated. In a second phase, after the breaker containment period, a removable grid was installed and speech therapy was indicated. In a third phase, the exfoliation of deciduous teeth and the eruption of permanent teeth were followed. The fixed vertical grid circuit breaker was sufficient to correct malocclusion, with no need to indicate corrective orthodontics.

**Discussion:** Interventions in growing patients are essential for the effectiveness of treatment. Changes in transverse maxillary measurements and tooth migration due to loss of space are corrected more quickly at this stage.

**Conclusion:** The proposed treatment was adequate for malocclusion, with no need for treatment with corrective orthodontics.



**Posterior Bite Plane- A Reconceptualization**

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**Introduction:** Posterior bite plane is an important adjunct in orthodontics. After opening the bite to required height and posterior teeth in contact reasonably, the therapy is continued. An uneven contact may result in supra eruption of the posterior. If the overbite is less than a 1-1.5mm, it will result in relapse before the bite settles down.

**Case report:** A girl aged 3 reported with upper front tooth placed behind the lower tooth. On examination maxillary right quadrant was in unilateral cross bite. The overbite was 3.5mm. After correction it was noted to have an overbite of 1mm, just enough to hold the bite, though later settled down to 3.5mm.

**Discussion:** Many times there is little or no contact in some teeth in a bite plane even if it comes from the best labs. If the crossbite before treatment is less than 1-1.5mm and if more attention is not given to the bite plane there will be relapse. To prevent this, optimal bite plane can be achieved by

1. Bite registration is recorded with needed clearance and models articulated and constructed on an articulator to give the optimal posterior contact and opening.
2. If correction is needed, bite is recorded again. The appliance is placed on the cast and articulated. The posterior bite plane after trimming adequately is redone with the correct occlusion.

**Conclusion:** Posterior bite plane should only be constructed with bite registration and done under articulation to prevent relapse or unwanted tooth movements.

**Distal Movement of Maxillary Molars with the Jones Jig Appliance: A Case Report**

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**Introduction:** Nonextraction treatment plans for Angle Class II malocclusion, or even when premolar eruption space is lost due to premature loss of primary molars, often require the distal movement of maxillary molars. Headgears are commonly used to apply external forces in order to distalize the maxillary molars. However, patient cooperation must be obtained for treatment to be effective. The Jones jig (JJ) appliance is one of the fixed appliances for moving molars distally which can be used with minimal dependence on patient compliance. The purpose of this case report is to present clinical cases of JJ appliance on distalization of maxillary first molars.

**Case report:** We present patients who were treated to correct Class II molar relationship with loss of space for maxillary second premolars using JJ appliance. Concomitantly, the orthodontic alignment of palatally erupted premolars was accomplished with the appliance.

**Discussion:** The results from JJ performed in our patients demonstrated the effective distal movement of maxillary molars. Additionally, improvement of the premolar position in the maxillary arch was achieved to some degree with the appliance.

**Conclusion:** JJ might be a clinical option for noncompliant Class II malocclusion patients with ease of fabrication.

**Digital Workflow for the Design and Construction of a Nasoalveolar Moulding Plate**

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**Introduction:** Nasoalveolar moulding is a form of presurgical infant orthopaedics used to improve the aesthetic outcomes of cleft lip and palate surgical repair. This case report presents a digital workflow using software to design and three-dimensionally print a nasoalveolar moulding plate from a scanned impression of an infant's maxillary dental arch.

**Case report:** An infant with a complete unilateral cleft lip and palate at 4 weeks of age had a plaster model produced from a polyvinyl siloxane putty impression of his maxillary dental arch which was scanned (3Shape E1 model scanner) and imported into 3Shape Software (Trios Design Studio 03/2020). A nasoalveolar moulding plate was designed on the software by adjusting an impression tray and creating an elastic button. The digital appliance was sent to a three-dimensional printer (Formlabs Form2) and printed with Dental LT Clear resin.

**Discussion:** Intraoral scanners can be used in infants to reduce the risks of traditional impressions including suffocation and aspiration of material. Advantages of a digitally designed nasoalveolar moulding plate include accuracy of fit within the sulcus and cleft defect, uniform thickness of the tray and decreased design and production time when compared to manufacturing using methyl methacrylate as a liquid and powder.

**Conclusion:** A digital scan was used to produce a nasoalveolar moulding plate with computer-aided design, and computer-aided manufacturing. The digital workflow was time efficient, easy to use and provided a satisfactory clinical outcome that could be useful in reducing the risks associated with putty impressions in infants.

**Orthodontic Traction of Maxillary Canine using a Removable Appliance in Mixed Dentition**

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**Introduction:** The prevalence of impacted canines ranges from 1 to 4% and the orthodontic traction treatment stands as a major challenge. The current case reports orthodontic traction of maxillary canine using a removable appliance in a subject with several malocclusions in mixed dentition.

**Case report:** A 10-year-old subject with several malocclusions attended the Preventive Orthodontics clinic. A unilateral skeletal class II malocclusion, dolichofacial pattern, mouth breathing, maxillary atresia, premature missing teeth; loss of space, superior and inferior negative arch-length discrepancy, buccal position of lower incisors and middle line deviation were observed. Lower and upper canines were impacted. As an interceptive treatment, a McNamara appliance was indicated to expand the upper arch and a removable expander to upright the molars on the lower arch. Orthodontic traction of maxillary canines was performed using a removable appliance. Then the patient was referred for further corrective treatment.

**Discussion:** Due to the importance of the canines on the dental arch, the pediatric dentist should consider the several interceptive treatments and refer the patient to Orthodontist if necessary. There are different ways of treatment that depend on the stage of dentition development, the canine position, the root resorption and patient's compliance to accept the treatment.

**Conclusion:** The treatments used on this case provided an improvement on patient's breathing, space was achieved for the upper teeth, the Class I molar relationship was obtained and the permanent canine was positioned in the dental arch. Therefore, the proposed treatment was suitable to correct this case of malocclusion.

### Treatment of a Posterior and Anterior Crossbite With a Single Modified McNamara Expander - A Case Report

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**Introduction:** Posterior and anterior crossbites are malocclusions in which self correction is rare. Early interception is required to allow the normal sagittal and transversal development of the face and occlusion.

**Case report:** An 8 year-old boy was referred to the Preventive Orthodontic Clinic at FORP-USP. The initial clinical and cephalometric examinations revealed class I molar relationship; negative overjet (-2 mm); bilateral posterior crossbite; deep palate; verticalized upper incisors, increased lower anterior facial height and passive lip sealing. A modified McNamara appliance with digital springs was used. The screw was activated 2x / day for 21 days until overcorrection of the posterior crossbite had been achieved. The digital springs on the maxillary central incisors were activated only once and a positive overjet obtained. The appliance was kept as a retainer for 6 months. In a second phase, a removable retainer with springs was placed for the correction of rotations. Comprehensive orthodontic treatment was planned to be delivered in permanent dentition.

**Discussion:** Posterior crossbite is commonly treated with rapid palatal expansion (RPE). However, RPE may increase the antero-inferior facial height due to extrusion of the supporting teeth, which can interfere on dolichofacial patient's passive lip sealing. Additionally, to correct the anterior crossbite the disocclusion of the bite is necessary to unlock the maxilla. The acrylic-occlusal splint diminishes the dental extrusion and disocclude the bite filling both requirements.

**Conclusion:** The modified McNamara's expander showed to be effective in correcting both anterior and posterior crossbites without causing harmful effects to the patient's profile.

**Orthodontic Space Opening in the Posterior Region of the Dental Arch During Mixed Dentition: Case Report**

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**Introduction:** Premature loss of posterior deciduous teeth is very common and this interferes with the chronology and sequence of dental eruption, leading to malocclusions like the deficiency of arch space for correct dental alignment and interference with tooth eruption chronology. Thus, the dentist should be aware of all factors involved in the dental arch space, and the methods to recover this space if it was lost early, and achieve success with patients.

**Case Report:** The present study showed a clinical approach with the use of a removable appliance with expander screw and a bite plate to treat a case of early loss of lower deciduous molars, with severe loss of space in the dental arch.

**Discussion:** The prescribed device must be considered, which can be as simple as possible, without ever forgetting that the patient's collaboration was extremely important for the results achieved.

**Conclusion:** The device used was effective for the recovering of space lost in the dental arch, referring to the second premolar, presented as a simple and satisfactory technique.

**Ectopic Eruption of First Permanent Molar Teeth: Case Report**

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**Introduction:** Ectopic molar eruption results from the abnormal eruptive pathway of the first permanent molar (FPM) causing its locking under the distal undercut of the second primary molar (SPM) and failure to reach normal occlusal levels. The earliest radiographic sign of ectopic eruption is the superior and mesial positioning of FPMs. According to the level of root resorption of SPMs, ectopic eruption is divided into 4 grades. The etiology of ectopic eruption is associated with dental anomalies such as tooth deficiency, supernumerary teeth and infra-occlusion of primary molars. The purpose of this report is to present 6 cases with ectopic eruption of FPMs that had no intervention.

**Case report:** In this report, the radiographs of 650 patients between the ages of 5-8 were examined. According to the degree of resorption, 72 patients were Grade 1, 14 patients were Grade 2 and 6 patients were Grade 3. 6 patients with ectopic molar eruption were selected for the presentation.

**Discussion:** Patients with ectopic molar eruption and inadequate intervention are in increased risk of space loss in the future. In Grade 1 and 2, the FPMs were successful to erupt without the removal of the SPMs, while in grade 3, resorption of the roots was aggravated. According to our results, observation and follow-up are sufficient in Grade 1 and 2, while invasive intervention is required in grade 3.

**Conclusion:** In teeth with a radiographic sign of ectopic eruption, early intervention is recommended to minimize the complications of space loss.

**Excision of Ulcerated Gingival Growth using Laser and Orthodontic Extrusion of the Dilacerated Permanent Central Incisor: Case Report**

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**Introduction:** Among the many developmental anomalies, dilacerated tooth is particularly disturbance in eruption and one of the causes of delay eruption in developing dentition. And is one of the most concern esthetic problem in upper anterior region. Management of dilacerated maxillary central incisor needs multidisciplinary approach.

**Case report:** The present case report describes the application of the diode laser in ulcerated gingival growth and orthodontic extrusion of the buccally erupted dilacerated permanent central incisor. The dilacerated tooth well aligned 4 months after excision and extrusion orthodontically.

**Discussion:** Teeth with dilacerated crowns erupted buccally displaced and associated with ulcerated growth. In this case report, dilaceration is at the crown and root junction and the prominence of root tip can be palpable but not exposed. The laser in addition to basic principles are required in paediatric dental practice which provides less traumatic experience in stress free environment.

**Conclusion:** Diode laser provides an effective, rapid, simple, bloodless and well accepted procedure in paediatric patients. In addition, minimal post operated discomfort and scarring was reported. The dilacerated tooth properly aligned in the arch without the further endodontic treatment and apicectomy procedure.



### **Rapid Palatal Expansion (RPE) and Utilization of E-space in Mixed Dentition: Mechanics that Help in the Corrective Orthodontic Treatment**

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**Introduction:** It's important to follow up child throughout their development to detect irregularities in their occlusion and to avoid or attenuate orthodontic treatments in the future. Posterior crossbite and transverse maxillary deficiency can easily be corrected by rapid palatal expansion (RPE) that enhances the width of the maxilla and promotes a gain of space in the arch. Another way to gain space in the arch is by using the E-space, which is the difference between the mesiodistal width of the second primary molar in comparison to the second premolar. This additional space can be used to resolve negative, mild, or moderate crowding. The purpose of this work was to report two clinical cases, showing the benefits of interceptive treatment using RPE and the preservation of E-space.

**Case report:** Two clinical cases that presented malocclusions due to lack of space in the lower and upper arch associated with maxillary transverse deficiency. In both cases, it was performed ERM and preservation of the E-space.

**Discussion:** Treatments choices helped to reduce and avoid future orthodontic problems, by eliminating interferences on development and growth. Orthodontic treatment, when realized in childhood, allows the correction of skeletal and dental problems. In the clinical cases presented, methods were used to correct malocclusions without the need for extractions. In addition, the severity of malocclusion has been reduced and corrective orthodontic treatment has been facilitated.

**Conclusion:** Correct diagnosis with orthodontic treatment performed at the right time promotes the patient's return to normal growth and development pattern.

## Correction of Anterior Crossbite in Early Mixed Dentition Period Using Removable Appliance with Z Springs

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**Introduction:** Anterior crossbite is defined as a malocclusion resulting from lingual positioning of the maxillary anterior teeth in relationship to the mandibular anterior teeth. Anterior crossbite should be treated at an early stage to prevent its progression into a complicated dento-facial anomaly. Several approaches have been reported in literature for treating anterior crossbite in mixed dentition. This report describes the treatment of anterior crossbite using a removable appliance with Z-springs and posterior bite plane.

**Case report:** Two 8 years old patients with Angle class I molar relationship and anterior crossbite involving the two upper central incisors are presented in this report. Anterior crossbite was accompanied by anterior displacement of the mandible in one of the cases. Anterior crossbite was corrected using a removable appliance with Z springs on both upper centrals and posterior bite plane. Treatment lasted for 3 weeks in one case, and 6 weeks for the other. No retention was provided as adequate overjet and overbite were obtained.

**Discussion:** Early treatment of anterior crossbite can reestablish proper muscle balance, develop a well-balanced occlusion and prevent dysplastic growth of both skeletal and dentoalveolar components. Literature reported the ideal age for correcting anterior dental crossbite as 8 to 11 years. Treatment with removable appliances helps in maintaining good oral hygiene and reduces chairside time. However, it requires good patient cooperation.

**Conclusion:** Removable appliances with Z springs are successful in treating anterior crossbite. Early diagnosis and treatment prevent the prospect adverse effects upon the dento-facial development and growth of the child.

**The Treatment of Deep Bite with LM\_Activators during Occlusal Development: A Case Report**

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**Introduction:** The correct timing for treatment of the deep bite is still widely debated in orthodontics. This clinical case of deep bite was treated early, during the dental exchange phases of the lateral sectors, using a removable device (LM-Activator).

**Case Report:** The treated case is a boy, 8 years old, with a Class I malocclusion, deep bite and crowding. A removable device only during the night was used (LM\_Activator). In ten months the bite was opened and the therapy was continued to obtain, always with the same kind of device, the correction of the crowding and to reach a correct canine position. Initial OVB value of 7 mm became of 2 mm.

**Discussion:** The good clinical result of opening the bite is due to the particular morphology of the device. An anterior vertical stop (incisal area) was used to prevent the over-eruption of both upper and lower anterior teeth. During the use of the appliance the primary molars did not have occlusal contact. This occlusal relationship will cause an extrusion of the molars/premolars during their active exchange phase. The facial type of the subject was also taken into account.

**Conclusion:** The analysis of this clinical case shows that an early approach to the treatment of the deep bite using mobile devices only during the night, is able to give excellent results. The use of differential thickness in the different sectors of the arches (anterior part compared with the posterior part of the mouth) is essential.

**Anterior Cross-Bite Treatment with Simple Removable Appliance: A Case Report**

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**Introduction:** Anterior crossbite is a condition that needs emergency treatment regardless of whether it is dental or skeletal in 6 - 12 year-old children. A malocclusion can lead to periodontal problems, mobility and even loss of the tooth due to loss of supporting tissue in the antagonist teeth. A simple removable appliance to prevent this situation solves the problem.

**Case Report:** Systemically healthy 8-year-old boy in mixed dentition referred to Inonu University Faculty of Dentistry with the complaint of non-aesthetic appearance of the upper anterior teeth. In the clinical examination, it was detected that the upper right central incisor of the patient is in cross-bite and maxilla is narrow. A removable acrylic appliance with raised occlusion were made including a labiolingual spring for buccal movement of the tooth, a vestibule arc to control buccal angulation, holder hooks and a slow expansion screw. The expansion screw was turned three times a week by the patient, the springs were activated by dentist with weekly controls. The ideal dental relationship of the central incisor and sufficient maxillar expansion were achieved in 1 month.

**Discussion:** In this case report, the anterior cross bite was treated during the mixed dentition period with a modified removable appliance. Pediatric dentists and clinicians should be aware of eruption failure and premature contacts can cause occlusal traumas and periodontal diseases.

**Conclusion:** To prevent maxillary growth in patients and to prevent permanent periodontal damage in antagonist teeth, urgent measures should be taken with modified removable appliances

**Treatment of Anterior Cross Bite in Mixed Dentition: Case Report**

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**Introduction:** In this case report, anterior crossbite treatment in dental Class I malocclusion with a removable appliance is presented.

**Case Report:** Systemically healthy 8-year-old boy in mixed dentition referred to Inonu University Faculty of Dentistry, Department of Pediatric Dentistry with the complaint of non-aesthetic appearance of the upper anterior teeth. In the clinical examination, crossbite is determined in the upper right central incisor (11). A removable acrylic appliance was designed with biteplane, vestibular arch, retainer adams clasps and a labiolingual spring in the palatine of the central incisor (11). The patient was recommended to use the appliance for at least 16 hours a day. Ideal dental closure of the central incisor was achieved after 2 months. The patient was followed up during the transition from mixed tooth to permanent tooth.

**Discussion:** Limiting the growth force of the maxilla by the mandibula causes loss of periodontal tissue in the antagonist tooth. Therefore, dentists should be aware of this situation and take early precautions with simple removable appliances to prevent patient becoming a fixed orthodontic patient in the future.

**Conclusion:** In this presented case, simple anterior crossbite were treated with modified removable appliance during mixed dentition.

**Treatment of Simple Anterior Cross-Bite: Two Case Reports**

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**Introduction:** The simple anterior cross-bite, which describes an occlusion defect between upper and lower incisor teeth, is a serious condition that can prevent the sagittal jaw development and cause attrition, gingival retraction and mobility of affected teeth if not treated in early time. The aim of this case report is to present the treatment of two simple anterior cross-bite cases using removable appliances with posterior bite-blocks and Z-springs.

**Case Report:** Patients referred to our clinic with complaints of dental caries and crowding. Cross-bites were seen in the maxillary left central incisor tooth of the 7-year-old female patient and the maxillary right central incisor tooth of the 7-year-old male patient in the first and second cases respectively. The removable appliances with posterior bite-blocks to eliminate over-bite along the treatment and Z-springs to move the teeth which in cross-bite were made for both patients. The patients were shown how to use the appliances and told the importance of using them regularly. In both cases, the treatment lasted in 20 days.

**Discussion:** The usage of removable appliances in the treatment of simple anterior cross-bites has many advantages such as short procedure time, ease in placing, removing and cleaning, being cheaper than fixed appliances.

**Conclusion:** If the patient's cooperation is sufficient, anterior cross-bites can be successfully treated with removable appliances in a short time.

**A Case Series of Early Orthodontic Treatment– Black or White !!!!!**

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**Introduction:** The aim of early orthodontic treatment is to correct the functional and morphological occlusion during developmental phase. This early treatment is begun during either the primary or transitional dentition to intercept malocclusions in a manner that will ultimately lead to a better, more stable result than that which would be achieved by starting treatment later.

**Case report:** First case demonstrates a novel technique for diastema closure by four bracket system. The technique allows maintenance of root parallelism during space closure in cases with reduced anchorage support. Second case demonstrates a mesiodens extraction followed by labial rotation of central incisor followed by labial frenectomy to ensure midline diastema closure. Third case demonstrates an early correction of single tooth crossbite using orthodontic brackets to avoid complicated malocclusions.

**Discussion:** Four-bracket system provided superior control allowing space closure by bodily tooth movement. Excellent root parallelism was achieved with this innovative technique. Due to the possibility of relapse, retention must always be considered in either interceptive or corrective treatment, regardless of how carefully the space was initially handled. To prevent a more complicated problem and a treatment at a later stage to correct the anterior crossbite early treatment is more advisable.

**Conclusion:** There is a consensus in the literature towards an early diagnosis and treatment which increases the possibility of good clinical results and the reestablishment of normal dental development. These case reports have presented a novel technique to enable bodily tooth movement (space closure) with maintenance of root parallelism and labial frenectomy for diastema closure and early correction of single tooth cross bite.

### Orthodontic Traction of an Impacted Maxillary Central Incisor using a Removable Appliance

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**Introduction:** Impaction of permanent maxillary central incisors is a rare condition that can affect esthetics and oral function. The etiology of impaction is multifactorial and orthodontic-surgical traction is often indicated.

**Case report:** The purpose of this report is to illustrate the treatment of a 7-year-old patient who presented an impacted permanent maxillary left central incisor. The patient underwent surgical intervention for bonding an orthodontic accessory to the impacted element, thus enabling its traction through a removable appliance. The initial preventive treatment lasted 3 months and after the appearance of the tooth in the oral cavity, a fixed orthodontic appliance was installed on the maxillary incisors to better position the traction tooth. At the end of the treatment, the patient achieved a satisfactory statically and functional occlusion with the central incisor in a normal position.

**Discussion:** the diagnosis and treatment of dental impaction requires the competence of several specialties, such as pediatric dentists, surgeons, orthodontists and patient collaboration. The correct diagnosis is one of the most important factors for proper planning, and the correct location of the included tooth is extremely important for the treatment.

**Conclusion:** Optimistic results can be achieved with the traction of the impacted upper central incisor using ideal orthodontic forces for traction, thus avoiding the problems arising from the absence of these teeth, which can affect phonation, swallowing, aesthetics and replacement prosthetics.



**The Dental Status of Native Speakers of languages with Different Articulating Characteristics**Rosana Nazaryan, Tetyana Khmiz, Viktoriya Kuzina*Pediatric Dentistry and Implantology Department, Kharkiv National Medical University, Kharkiv, Ukraine*

**Background:** A person has a very important skill - the ability to communicate using words. The formation of sounds occurs due to the elements of speech apparatus, such as lips, tongue, alveolar ridge, hard and soft palate, teeth and vocal cords, which have a similar structure in all people. The peculiarities of the pronunciation of sounds in different languages create unequal loads on each of these elements. The restructuring, that occurs due to the load can lead to the formation of clinical manifestations of pathology. The purpose was to study the results of dental examination of native speakers of languages with different articulating characteristics.

**Methods:** The extraoral and intraoral examination of the maxillofacial area of natives of the Asian region, who during the first 10-15 years of their life used for communication Arabic only, were carried out. Angle`s classification was used to determine the type of orthodontic pathology. The articulatory movements of the tongue and lips were recorded using video recording.

**Results:** All 64 persons examined had shortening of the lower third of the face, protrusion of the anterior teeth of the upper jaw, narrow nostrils, and some other similar facial features, as well as occlusion pathology.

**Conclusion:** The obtained data should be taken into account when examining patients whose native language or language in which the patient speaks most of his life has a specific articulatory characteristic. This will make it possible to correct and optimize the treatment and preventive measures.

**Determinant Factors of increased Severity of Malocclusion in Schoolchildren: a 7-year Cohort Study**

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**Background:** Identification of the risk for severity of malocclusion in the permanent dentition based on information from mixed or primary dentition may assist in defining the most appropriate intervention stage and providing adequate orthodontic therapy. The aim of this study was to identify risk factors associated with the increased severity of malocclusion between mixed and permanent dentition.

**Methods:** At baseline (T0), 851 students from 7 to 12 years of age, in the mixed dentition, were included. All participants who after 7 years had not received any orthodontic treatment were invited to participate in follow-up (T1) (n = 411). To assess malocclusion, the Dental Aesthetic Index (DAI) was used at T0 and T1, comparing its absolute value and each of the 10 items that compose it. Untreated dental caries and early loss of primary teeth were also evaluated. The ordinal unadjusted and adjusted logistic regression was adopted (p-value 0.05).

**Results:** Malocclusion (DAI 25) was present in 49% of participants (62.2% exposed and 32.8% unexposed). The variables associated with malocclusion in permanent dentition were: anterior irregularity in mandible  $\geq 2$ mm (OR: 2.02, 95% CI 1.15-3.57; p = 0.015), maxillary overjet  $\geq 4$ mm (OR: 2.99, 95% CI 1.48-6.06; p 0.001) and anterior open bite (RR: 6.33, 95% CI 1.74-22.95; p=0.005).

**Conclusion:** The anterior mandibular irregularity of 2mm or more, increased maxillary overjet, and anterior open bite were considered as risk factors of the increased severity of malocclusion after the transition from mixed to permanent dentition.

**Anterior Open Bite Closure with Fixed Palatal Grid: A Viable Alternative for the Early Stage**

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**Introduction:** The anterior open bite is a malocclusion that can be defined by the lack of anterior occlusion, while the posterior teeth occlude. Its etiology is multifactorial, which makes the resolution of this malocclusion a challenge for the professional. The objective of this case report is to present the treatment of anterior open bite in a patient in mixed dentition with a palatal grid.

**Case report:** Female patient, 7 years old, presented with an anterior open bite malocclusion in mixed dentition phase due to digital finger sucking and lingual interposition. After the clinical examination and medical history, the treatment of choice was the placement of a fixed palatal grid, in order to eliminate the harmful habit, minimizing the unfavorable forces and consequently allowing the oral muscles to close the bite until the patient is in an optimal phase for fixed orthodontic treatment. After 11 months of using the fixed palatal grid, we had a favorable reduction in the anterior open bite, and in sequence the beginning of the fixed orthodontic treatment for further correction.

**Discussion:** Regarding its etiology, the anterior open bite is considered as one of the most difficult malocclusions to treat. The correct diagnosis and identification of the etiological factors increase the chances of improvement of the anterior open bite, since the etiological factor is controlled.

**Conclusion:** The fixed palatal grid proved to be a viable alternative for the closure of the anterior open bite, as it eliminated the etiological factor and contributed to the fixed orthodontic treatment.

**Surgical Derotation- An Alternative to Orthodontic Correction**

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**Introduction:** Tooth rotation is defined as the mesiolingual or distolingual intra-alveolar displacement of the tooth around its longitudinal axis. It can be corrected by removable, semifixed or fixed appliances depending upon the severity of rotation. However, there is a tendency of this derotated tooth to relapse following completion of treatment which is because of the stretched supra-crestal fibres during derotational correction. Surgical derotation is a method of detachment of a rotated tooth from its periodontal and supracrestal fibers followed by positioning it to its normal alignment in the dental arch.

**Case Report:** Presentation of three cases with rotated permanent immature maxillary central incisors which were corrected by surgical derotation technique and were followed up for a period of 12-18 months.

**Discussion:** Once the tooth is derotated surgically, root of the involved tooth is detached from all the periodontal and gingival fibers, including epithelial attachment, however, the cells of these fibers attached to both cementum and alveolar bone remain viable. Within 2 to 3 weeks, these periodontal and gingival fibers reorganize themselves and a new attachment is formed at the corrected position of the tooth, which is confirmed by normal percussion sound. Revascularization can be confirmed radiographically by evidence of continued root formation and pulp canal obliteration. Regeneration can be confirmed by pulp sensibility tests.

**Conclusion:** Surgical derotation is an alternative, immediate and permanent technique of correction of rotated immature permanent maxillary incisor.

**Management of Class III Malocclusion with Anterior Cross Bite using Face Mask Therapy**

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**Introduction:** Class III malocclusion involves a number of cranial base and maxillary and mandibular skeletal and dental compensation components. “To or not to” intervene is a common dilemma faced by orthodontists and pediatric dentists when confronted with a developing Class III malocclusion. The protraction facemask has been widely used in the interception of developing Class III malocclusion with maxillary deficiencies.

**Case Report:** The following case report describes management of a 10-year old male patient in mixed dentition with developing class III malocclusion with facemask.

**Discussion:** Early recognition of characteristics predisposing to developing malocclusion in permanent dentition remains the mainstay in interceptive and preventive orthodontics. Face-mask therapy for early growing age in adolescence helps to prevent class III malocclusion and eliminates the psychological problems in adolescence and the patient family. The developing class III malocclusion could be attributed to maxillary skeletal retrusion, mandibular protrusion or combination of both.

**Conclusion:** The most important factor for treatment of Class III malocclusion in growing patient is case selection. Early diagnosis of class III malocclusion with facemask treatment can provide better and stable results. The answer to successful management of class III malocclusion is to correct anterior cross-bite as early as possible which allows normal unrestricted growth of maxilla and also guide mandible to normal position.

### **Correction of Anterior Crossbite using Removable Appliances in the Early Stage of Mixed Dentition: Two Case Report**

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**Introduction:** The abnormal reversed labiolingual relationship between the maxillary and mandibular teeth is defined as anterior crossbite. This malocclusion can cause functional and esthetic disorders and lead to many complications in the dentofacial system. Therefore, the early diagnosis of anterior crossbite and treatment of it with fixed or removable appliances are crucial for the development of normal occlusion. This report is aimed to present the management of two cases of anterior crossbite with removable appliances.

**Case report:** 8-year-old two male patients referred to the Department of Pediatric Dentistry at the Faculty of Dentistry from Gaziantep University with a complaint of a non-aesthetic appearance due to a crossbite of the right maxillary incisor. Upper removable appliances were applied to the patients and active treatments were completed in 4 weeks. The bite was opened by incorporation of posterior bite plane into the appliance to achieve a 2 mm incisal clearance. Activation was carried out two times in a week with quarter-turn (90° rotation) for each time.

**Discussion:** The anterior crossbite is rarely improved spontaneously because of the maxillary incisors locate behind the mandibular incisors and it is caused malocclusion if it is not treated at an early stage. The aim of the management is to position the affected maxillary teeth labially to the normal overbite relationship.

**Conclusion:** The present report showed that removable appliances are a successful alternative for the anterior crossbite treatment instead of complicated fixed orthodontic appliances.

## Management of Midface Hypoplasia in a Cleft Patient using Alt Ramec Protocol with Face Mask Therapy: A Case Report

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**Introduction:** Midfacial retrusion is the most common problem associated with cleft patients. The conventional use of rapid maxillary expansion combined with facemask therapy in growing cleft patients brings about average protraction 1.5–3 mm in 10 to 12 months. Recently, an innovative technique involving alternate rapid maxillary expansions and constrictions (Alt-RAMEC) was developed by Liou and Tsai in 2005 for extensively disarticulating circum-maxillary sutures without overexpansion. Therefore, this case report highlights the collaborated use of a facemask with Alt RAMEC to treat midface deficiency in cleft patients.

**Case report:** An 11-year-old female patient was presented with unilateral cleft lip and palate, concave facial profile, anterior crossbite (overjet: -5mm) and bilateral posterior crossbite. Cephalometric analysis showed skeletal Class III malocclusion with maxillary hypoplasia. The 5-week ALT RAMEC protocol was chosen using a bonded Hyrax, commencing with expansion in the first week, alternating to constriction in the second week, and ending with expansion in the fifth week. The daily expansion or constriction of the Alt-RAMEC was 1 mm. Following this, patient was asked to wear Delaire type face mask daily for 14 h engaging with 5/16" elastics (14 oz). The correction of the reverse over jet was achieved in 6 months.

**Discussion:** ALT RAMEC, when applied closer to the peak of growth, showed more stable results than RME in cleft patients. It has been reported that the amount of maxillary protraction was 5–6 mm in 5 months under Alt-RAMEC and was significantly more than rapid maxillary expansion.

**Conclusion:** This approach improved facial profile, corrected crossbite and can be an effective treatment option for management of young cleft patients. However, the patient has to wear the appliance conscientiously for the desired overcorrection of maxillary protraction to be successful.

**Digit Sucking- Diagnosis and Management: A Case Report**

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**Introduction:** Thumb- and digit sucking habits have a reported incidence ranging from 13% to almost 100% at some time of infancy. Prolonged thumb sucking may cause permanent damage beyond a certain age. Pediatric dentists have early access to guide the developing dentition to a state of normalcy in line with the stage of oral-facial growth and development. The purpose of this report is to present how correction of a habit can alter the course of development of dento-facial structures.

**Case Report:** A 12-year-old male patient reported to the hospital with the chief complaint of irregularly placed upper teeth. A complete clinical examination revealed that the patient had a digit sucking habit with a functional tongue thrusting habit. An Angle Class II developing malocclusion with an open bite was noted with severe maxillary skeletal discrepancy. The parents were informed about the malocclusion, and a written consent was taken. The treatment plan included mechanical therapy with hay rakes and reminder therapy with hand gloves. The digit sucking habit was corrected and subsequent follow up showed drastic correction of skeletal and dental open bite by itself.

**Discussion:** Digit sucking at this age requires intervention and if not provided, continues to progress leading to severe malocclusion, thus early treatment can re-establish proper muscle balance and well-balanced occlusal development.

**Conclusion:** Correct diagnosis, timely intervention with simple and traditional methods not only help in habit correction, but also lead skeletal and dental structures to normality.



**Interception of Mouth Breathing Habit using Myobrace Appliance Therapy: A Case Report**

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**Introduction:** Comprehensive research has shown that mouth breathing, or incorrect myofunctional habits are one of the major causes of malocclusion in children. Mouth breathing habit limits the child's craniofacial development resulting in orthodontic problems. Myobrace are orthodontic appliances that are preformed functional orthodontic devices, especially used in interceptive orthodontic cases. The Myobrace system packages airway and habit correction, arch expansion, and dental alignment into a comprehensive treatment system ideally suited to treat children aged 3-15 years.

**Case report:** Here a case report of a patient with developing malocclusion in the late mixed dentition stage has been presented. On complete evaluation, it was indicated that the patient was a mouth breather with a reverse swallowing pattern and aberrant lip function. A considerable improvement in the dental alignment and facial development occurred after 6 months, using the Myobrace for Teens series to establish nasal breathing and correct the myofunctional habit.

**Discussion:** The main treatment goals of Myobrace include correction of nasal breathing, orofacial musculature, arch form and teeth alignment. By focusing on the etiological factors that cause malocclusion, the appliances aim to correct the poor myofunctional habits affecting the teeth, jaws and facial development, offering patients a more natural orthodontic solution.

**Conclusion:** Myobrace can be considered as a viable alternative for intercepting habits and developing malocclusions at an early age. It provides brace free correction of skeletal and dental discrepancy, however, a short phase of fixed orthodontic correction may be necessary in some patients for finishing and detailing.

**Diagnosis and Early Treatment of Anterior Crossbite: Clinical Case Report**

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**Introduction:** Better therapeutic prognosis can be provided if anterior crossbite is diagnosed during early childhood at the beginning of the mixed dentition period. Incorrect axial inclinations between the upper and lower incisors involving one or more teeth is usually observed, due to postural or skeletal mandibular projection resulting from excess of the mandible, maxillary deficiency or a combination of both. The objective of this study was to report a clinical case of anterior crossbite treated by vestibule-version of the upper incisors with soft forces, using a bite plate device and partial fixed appliance.

**Case Report:** A male caucasian patient, 10 years old, with normal dental and gingival aspects, presenting good general health, was referred to the discipline of Preventive Orthodontics at FORP-USP. Radiographic, facial and clinical analysis revealed a class I malocclusion diagnosis, with anterior dental crossbite. Upper incisors were projected forward with a partial fixed orthodontic appliance, associated with a removable bite opening device.

**Discussion:** The patient's compliance using the removable device provided excellent clinical results confirmed cephalometrically, demonstrating that the early treatment of the anterior crossbite is effective in obtaining occlusal, aesthetic and functional balance.

**Conclusion:** Early treatment of anterior crossbites represents a challenge for orthodontists. The proposed treatment proved to be effective in correcting the referred malocclusion.

**Pediatric Trainers in Myofunctional Therapy**

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**Background:** Orthodontic treatment today comprises a wealth of fixed and removable appliances, sometimes in combination with extraoral ones. Interceptive orthodontics is a phase in preventive dentistry that deals with the diagnosis and management of potential irregularities and malocclusion in the developing dentofacial complex. It aims to treat both dental and skeletal anomalies and abnormal muscle and tongue functions. Guidance of the eruption and development of the primary and permanent dentitions is an integral part of the care of paediatric patients. Such guidance should contribute to the development of a permanent dentition that is in a harmonious, functional and aesthetically acceptable occlusion.

**Literature Review:** Functional orthodontics advocates myofunctional treatment of malocclusions. Stimulation or inhibition of the activity of masticatory and/or facial muscles establishes muscular balance in the craniofacial system, improves the relation between upper and lower jaws and forces teeth to achieve better position and proper articulation. New functional appliances, known as Preorthodontic Pediatric Trainers, have been developed recently by Myofunctional Research Co. (MRC). Since 1989, MRC has pioneered the use of single-sized, prefabricated appliances using myofunctional habit correction while the child is still growing to improve jaw development.

**Conclusions:** Preorthodontic trainers or pediatric trainers are recent developments used in myofunctional therapy, which may represent viable alternatives to conventional myofunctional appliances for the treatment of malocclusions at an early age by advancing the mandible and improving dental alignment.

### **Protraction Facemask with Rapid Maxillary Expansion for Early Treatment of Class III Malocclusion: A Case Report**

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**Introduction:** Class III malocclusion is characterized by deficiency or maxillary retrusion, mandibular overgrowth, or a combination of both. In this report, the results of an early treatment with protraction facemask and rapid maxillary expansion of a class III malocclusion patient is presented.

**Case report:** A 9-year-old male patient in early mixed dentition is presented. Clinical and radiographic examinations revealed a Class III skeletal relationship, vertical growth pattern (hyperdivergent), increased mandibular length, mandibular protrusion, anterior crossbite, right upper incisor agenesis, and hereditary Class III pattern. The treatment consisted in the use of a Hyrax appliance with occlusal coverage and Petit facemask (14 hours/day, 400 gr/side) for 11 months. Once the positive overjet and Class I molar relationship were achieved, the use of the facemask (12 hours/day) was continued for an additional 6 months as retention. Clinical and radiographic evaluations were performed in the controls.

**Discussion:** The main advantage of early Class III malocclusion treatment is to minimize the need for orthognathic surgery. In the present case report, orthopaedic treatment with protraction facemask and rapid maxillary expansion displayed excellent results even when the patient presented mandible protrusion and hyperdivergent growth. Nonetheless, it is fundamental to continue with the controls until the age of 16 or 17.

**Conclusion:** The use of protraction facemask with rapid maxillary expansion for early treatment of Class III malocclusion showed substantial improvements in skeletal and dental aspects after 7 months post-treatment. Early Class III orthopaedic treatment with protraction facemask can be a successful alternative.

## Dentigerous Cyst Observed in the Mixed Dentition Period: A Case Report

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**Introduction:** The dentigerous cyst is the second most frequent odontogenic cyst after the radicular cyst. Typically, dentigerous cysts are asymptomatic and are commonly diagnosed incidentally. They are benign odontogenic cysts associated with the crowns of permanent teeth and usually are characterized as unilocular radiolucent lesions which are rarely seen during childhood.

**Case report:** A 10 year-old girl presented to our clinic due to caries in primary teeth. A panoramic radiograph of the patient revealed properly limited radiolucent areas associated with the crowns of the permanent premolar teeth in the lower left jaw. Iodoformed sponge was inserted into the socket after the first and second primary molars were removed under local anesthesia. The sockets were washed with isotonic serum every day for the first week; and this procedure continued one day a week after the first week. In order to prevent epithelialization in the extraction socket site and to prevent mesialization of the lower left 1st molar, a movable placeholder was planned that could enter into the extraction socket.

**Discussion:** Treatment of this lesion when seen in the mixed dentition requires sensitivity due to the risk of damage to developing permanent teeth. It is important to choose a treatment method correctly and to apply minimally invasive surgical procedures.

**Conclusion:** It was concluded that when treating dentiginous cysts in the mixed dentition period, it is more conservative to perform lesion decompression instead of enucleation and curettage procedures.

### **The Effect of Breastfeeding Duration and Non-Nutritive Sucking Habits on Malocclusion in the Primary Dentition**

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**Background:** Malocclusion is a condition characterized by abnormal relationships among the teeth or dentitions. It is one of the most common problems affecting the human oral cavity, along with caries, gingivitis and dental fluorosis. Malocclusion in the primary dentition can lead to malocclusion in the permanent dentition. Therefore, it is necessary to define the factors affecting malocclusion and apply preventive strategies in this period to reduce the prevalence and severity of future malocclusion. The purpose of this study was to assess the effect of breast feeding and non-nutritive sucking habits on occlusion in the primary dentition.

**Methods:** This study sample consisted of 248 preschool children (3–5 years of age) who had detailed infant feeding and a history of non-nutritive sucking habit as determined by a structured questionnaire for parents. All subjects had an oral examination by two dentists, blinded to different variables that were evaluated.

**Results:** Of the total sample, 82% were breastfed more than 6 months; 25% had pacifier sucking beyond the first year of life; 58% had bottle-feeding; and 47% had parafunctional oral habits. Malocclusion data showed that deep bite was the most prevalent condition (17%), followed by overjet (0.06%) and anterior crossbite (0.04 %). 85% had Class 1 Angle classification; and 83% had a normal canine relationship.

**Conclusions:** The findings did not indicate a statistically significant association between breastfeeding duration, non-nutritive sucking habits and malocclusion. More studies with larger samples are needed to better assess possible determinants of malocclusion.

## The Treatment of Developing Crowding with Eruption Guidance Appliance (LM-Activator): A Retrospective Longitudinal Study

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**Background:** the aim of this study was to analyse the effect of eruption guidance appliances (LM\_Activator) on the crowding and on the arch perimeter of upper and lower dental arches.

**Methods:** The sample consisted of 30 dental casts of patients in mixed dentition with crowding in both upper and lower dental arches. The patients were all treated with eruption guide appliance for a period of  $14 \pm 3$  months. A 3D analysis software was used to measure the digital model of patients before the treatment started (T0) and after the end of it (T1). The crowding degree and the arch perimeter were measured on both dental arches. The obtained data were analysed with Statistical Package for Social Science (SPSS) software.

**Results:** The average of crowding detected was  $2.12 \pm 0.87$  mm on the maxillary and  $3.36 \pm 2.00$  mm on the mandible. The lower arch revealed a statistically significant ( $p \leq 0.05$ ) major crowding than the upper arch. The EGA used during the therapy resolved the crowding in both jaws significantly ( $p \leq 0.01$ ). The arch perimeter of both maxilla and mandible increased to 4.80mm and 5.23mm respectively with a statistical significance ( $P < 0.05$ ). Any inter-arches significant difference was recorded ( $P = 0.616$ ).

**Conclusions:** The EGA can effectively resolve the crowding during the mixed dentition. Since the mandible has generally more crowding than the maxilla, there are better outcomes in the mandible rather than in the maxilla. In addition, this intraoral device can effectively promote the growth of the arch perimeter of both jaws.

## Management of Impacted Dilacerated Maxillary Central Incisor: A Case Report Management of Impacted Dilacerated Maxillary Central Incisor: A Case Report

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**Introduction:** Dilaceration is a root anomaly that is frequently seen in central incisors, which may also occur due to trauma, supernumerary tooth or iatrogenic reasons. In this case report, it was aimed to describe the treatment of an upper incisor that was impacted due to a dilacerated root and caused the midline to slip.

**Case report:** A healthy pediatric patient with a chronological age of 12 was referred to our clinic because of aesthetic concerns due to tooth deficiency in the upper anterior region. In panoramic and periapical radiographs, it was determined that the upper left central tooth was impacted due to its root dilaceration. First of all, a fun type slow expansion appliance was made to solve the space limitation in maxilla. When enough space was gained at the end of the 2nd month, the active appliance was removed and a nance appliance with a tooth was made. As a result of consultation with orthodontists, it was decided to use the nance appliance until a button was attached for dental movement. Thus, the patient's aesthetic anxiety was eliminated while waiting for orthodontic treatment.

**Discussion:** Malocclusions in the growth and development period, should be treated with a multidisciplinary approach with orthodontists and pedodontists.

**Conclusion:** The malocclusion of the patient was corrected with the treatment. In addition, the correction of the aesthetic appearance formed in the anterior region made the child psychologically satisfied.



## **Modified Distal Shoe Space Maintainer for the Guidance of 1st Permanent Molar in Unilateral Premature Loss of Both Primary Molars: Case Report**

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**Introduction:** The main objective of space maintenance is to prevent loss of arch length, width and perimeter by maintaining the relative position of the existing dentition. In case of premature loss of the second primary molar, mesial migration of the permanent molar may occur before and during its eruption, leading to space loss. In this case, we have successfully prevented unilateral space loss using modified distal shoe space maintainer (MDSSM).

**Case Report:** A 3years 6months child reported to clinic with pain and recurrent abscess in lower right back region with poor prognosis of lower right primary molars which needed to be extracted. Lower left teeth were already having an SS crown. 1st visit band was placed on left primary 2nd molar and SS crown on right primary canine in the lower arch. Impressions were taken and bands and crowns were transferred. On the lower cast modified lingual arch (19-gauge orthodontic wire) with unilateral conventional distal shoe design was made. During 2nd visit, extraction of right side molars followed by immediate cementation of MDSSM along with radiographic confirmation was done, for the correct position of the intra-alveolar extension of the appliance.

**Discussion:** In this case conventional unilateral space maintainers would have been unstable and hence, the design was modified to maintain the mesio-distal dimension of the space maintainer. The appliance can be replaced by other types of space maintainers depending on the clinical conditions of patients.

**Conclusion:** MDSSM is not only non-functional, fixed and highly stable but also was easily accepted by children.

Preventive and Interceptive Orthodontics

### **Protraction of The Maxilla in The Treatment of Skeletal Class III Malocclusion during the Mixed Dentition Phase: Clinical Case Report**

Patricia Maria Monteiro, Maya Fernanda Manfrin Arnez, Paula Regina Ávila Silvano, Wendes Dias Mendes, Paôla Caroline Da Silva Mira, Mayara Manfrin Arnez, Maria Cecília Gorita Santos, Mirian Aiko Nakane Matsumoto, Maria Bernadete Sasso Stuani  
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**Introduction:** Treatment of anterior crossbite during deciduous or mixed dentition is coherent, since it can cause attrition on the buccal surface of the upper teeth involved, gingival recessions in the lower incisors, in addition to altering the normal growth of the jaws in anteroposterior direction. The present study reported the early treatment of skeletal anterior crossbite, using Rapid Maxillary Expansion (RME) and Maxillary Protraction (MP) with Petit's mask.

**Case report:** A 8-years old patient was referred to the Preventive Orthodontics discipline at FORP-USP. The patient presented negative overjet and accentuated overbite, as well as a concave facial profile. Molar and canine relation was Angle Class III. Cephalometric examination indicated skeletal class III, vertical and retracted upper incisors in relation to their apical base. Treatment performed was orthopedic correction with RME using McNamara device and MP with a face mask. In order to obtain an increase in the vertical dimension, occlusal covering of McNamara device was made in such a way to completely de-occlude the anterior teeth and provide MP.

**Discussion:** Proposed therapy showed satisfactory results for the correction of class III, even though it did not achieve a true protraction. Correction of anterior crossbite and the clockwise rotation of the mandible contributed favorably to the patient's aesthetics, improving her self-esteem. In the future, it will be necessary to indicate corrective orthodontics to finalize the case.

**Conclusion:** The proposed treatment was adequate to correct the malocclusion during the mixed dentition phase, and the results showed the effectiveness of the used method.

### **Parents` Perception of Their Children`s Occlusal Characteristics Reflects the Need of Orthodontic Treatment in Mixed Dentition?**

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**Background:** Assess if the perception of parents or guardians about anterior occlusal characteristics reflects the need for treatment in their children`s mixed dentition.

**Methods:** A cross-sectional population-based study was carried out with 1436 children aged of 8 to 10. A questionnaire was sent to parents and guardians with a question about their child`s anterior occlusal characteristics. The anterior occlusal characteristics were diagnosed according to the criteria of the Dental Aesthetics Index (DAI). Income, sex and education level of the head of the family were also assessed. Individual analyzes were performed, relating the result as independent variables. Results: Associations were found between parents or guardians` perception and the variables maxillary misalignment 2mm (p 0.001) (PR: 1.298; 95% CI: 1.137-1.482), and mandibular 2mm (p 0.05) (PR: 1.282; 95% CI: 1.014- 1,621). No associations were found regarding diastema 2mm and increased overjet ( 4mm), anterior and top crossbite, income, sex and education level of the head of the family.

**Conclusions:** Maxillary and mandibular misalignment 2mm is perceived by parents or guardians in the mixed dentition.

**Loss of Space after Premature Loss of Primary Molars**

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**Background:** The aim of this pilot prospective study was to evaluate changes after early loss of deciduous molars in the lower arch.

**Methods:** The inclusion criteria were children between 6 and 9 years old with indication of extraction of the primary molar in one hemiarch. The participants were randomly allocated in two experimental groups: G1 (early loss of first deciduous molar) and G2 (early loss of second deciduous molar). To assess the space, the arches were molded at two different times: T1 - before extraction of the primary tooth; T2 - 7 to 14 days after extraction of the primary tooth. Data were collected from plaster models by one blinded and calibrated evaluator using a digital caliper. The measures evaluated were linear distance of extraction space, intercanine width and arch width. Statistical analysis was performed using SPSS 20.0. The Shapiro-Wilk test were used ( $p < 0.05$ ) to assess the normality.

**Results:** In G1 there were no statistically significant difference between T1 and T2. In G2 there were a significant difference between T1 and T2 in the linear distance.

**Conclusions:** In view of the early loss of the deciduous second molar the space maintainer must be installed immediately after extraction.

### **Comparison of Patient Cooperation during Corrective Orthodontic Treatment between Patients with and without Prior Interceptive Orthodontic Treatment**

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**Background:** Cooperation is a fundamental factor in achieving clinical success of orthodontic treatment and can be influenced by multiple factors such as the professional-patient relationship, the relationship with their parents, the motivation and the duration of the treatment. The purpose of this study was to evaluate differences in cooperation of adolescent patients subjected to orthodontic treatment between those who had received prior interceptive orthodontic treatment with those who did not.

**Methods:** A prospective observational analytical cohort study was carried out. A sample of 132 patients who received orthodontic treatment between 10 and 17 years of age treated at the CES University Orthodontic Postgraduate Clinics and in 9 private practices in Medellín Colombia was selected; patients were divided in two groups of 66 patients; one that had received previous interceptive treatment and another that only received corrective treatment. Cooperation was assessed through the Orthodontic Patient Cooperation Scale (OPCS) at four moments during the first year of treatment (three, six nine and twelve months).

**Results:** An estimation of cooperation revealed that there was a significantly greater cooperation ( $M = 4.6$ ) in patients who had received early treatment compared to those who only had corrective treatment ( $M = 2.3$ ).

**Conclusions:** Patient cooperation during orthodontic treatment was higher in patients who had received early orthodontic treatment when compared with those who had not received previous treatment.

## **Canine Palpation: An Audit of the Record Keeping of the Palpation of the Maxillary Canines at a Critical Age**

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**Background:** The identification of ectopic maxillary canines is vital with an increasing number of medico-legal cases. It can prevent delayed management and extra costs to the patient in the future. Dental practitioners have a duty to monitor development, malocclusion and also signs of ectopic teeth. Current literature suggests that 1-2% of maxillary canines are ectopic, majority being palatal. The audit aimed to evaluate how the directorate records canine palpation in examinations.

**Methods:** The audit was conducted over a two-month period (February 2019- March 2019) and isolated patients of recall examination and new examinations of ages 10-11years. It aimed to evaluate documentation of canine palpation in clinical records of patients aged 10 -11year olds with unerupted canines, as per standards set by the Royal College of Physicians and Surgeons.

**Results:** Results from the audit carried out in the directorate found that in a group of 38 patients aged 10-11 with unerupted canines, palpation was not recorded in 76%. The results showed a large deficit in the number of patients being palpated buccally for canines and consequently recorded.

**Conclusion:** Although most practitioners know to palpate the buccal sulcus for the canine, it is often not thought to be noted down. This can lead to medico legal difficulties in the future. It is especially important to note in our directorate as the practitioner for the patient is often changed, therefore continuity will be essential for the next provider.

**Combined Surgical Removal of Impacted Intruded Primary Incisors, Supernumerary Teeth and Odontomes and Orthodontic Traction of Maxillary Impacted Central Incisors: A Case Series**

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**Introduction:** Impaction of maxillary central incisors occurs by various local causes as supernumerary teeth, odontoma and space loss. Surgical removal of impacted local causes followed by exposure and orthodontic traction of impacted central incisors are presented in this case series report.

**Case report:** Six clinical cases are reported of impacted maxillary central incisors by impacted intruded primary incisors, supernumerary teeth and odontoma that were treated in the department of Pedodontics. Treatment included surgical removal of local factors under local anesthesia followed by surgical exposition of crowns and bonding of orthodontic buttons for traction to facilitate eruption by closed eruption technique along with removable appliances. Most cases required a 2x4 appliance where 0.014 mm NiTi wire was used to bring incisors into proper alignment. Clinical examination, vitality tests and radiographic evaluations were performed at scheduled follow-ups. The average age at the time of surgery was 9Y1M and follow up period averaged 2Y6M. All impacted incisors were successfully aligned with good periodontal conditions.

**Discussion:** Multiple approaches by surgical and short orthodontic therapy brought a good result for esthetic and compliance. Good follow ups, radiographic watch of the root development and pulp vitality checks are needed for good prognosis of these young permanent teeth in mixed dentition stage.

**Conclusion:** Timely surgical extraction of local factors followed by surgical exposure and sequential orthodontic intervention by removable and fixed appliances made the treatment a success, where both aesthetic and function of maxillary central incisors were achieved for psychological wellbeing of the child patient.

**A Case Report on Surgical Management of Palatally Positioned Impacted Mesiodens**

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**Introduction:** Supernumerary teeth are extra teeth in comparison to normal dentition. In permanent dentition 0.15 to 3.8% incidence of mesiodens is reported, with two-fold risk in the male population with a positive family history. Mesiodens may be an isolated finding or part of a syndrome. The possibility of autosomal dominant transmission with an environmental influence explains the male dominance.

**Case Report:** An 8-year old girl with a non-contributory family history had unerupted maxillary anteriors. Clinical examination showed firm deciduous incisors. An Orthopantomograph revealed two supernumerary teeth palatal to the permanent maxillary incisors. Deciduous central incisors were extracted to aid in occlusal movement of permanent teeth and the mesiodens to a lower position so that the surgical removal, if attempted will be less traumatic. After 8 months, radiographs showed occlusal movement of the permanent teeth and the mesiodens, but still no signs of eruption. Surgical removal of the mesiodens was carried out and 3 months later the permanent incisors erupted uneventfully.

**Discussion:** The timing of mesiodens removal is controversial. Extraction in early mixed dentition will allow permanent incisors to erupt spontaneously and minimize the need of orthodontic treatment. Delay in extraction of a mesiodens might result in failure of spontaneous eruption of permanent incisors due to diminished eruptive forces which might require comprehensive orthodontic treatment.

**Conclusion:** The present report shows a promising result for successful eruption of permanent incisors even though the surgical removal of the mesiodens was delayed. The delaying of extraction of the mesiodens did not hamper the eruption potential of the permanent maxillary anteriors.



### Adaptation Accuracy of Orthodontic Brackets to the Tooth Surface

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**Background:** A close marginal adaptation between the tooth and the bracket is important since it provides the space for adhesive. To withstand the orthodontic forces, the adhesive to the bracket must have sufficient sheer bond strength. The aim of this study was to determine the accuracy of the marginal adaptation of the bracket bases of seven different orthodontic brackets to the tooth surface of a right upper first premolar (ie. Abzil, Forestadent, GAC, Gemini, IMD, Ormco and Victory LP).

**Methods:** This research was an in vitro, descriptive comparison study. Fifteen caries and crack free human upper first premolars were used. The brackets were placed at a set prescription of 4mm on the teeth. After bracket placement, the dontrix gauge was applied to the bracket to engage the slot area. This allowed for reproducibility for the seven brackets with all teeth. The space between the bracket margins and tooth interface was viewed under the Stereomicroscope (Carl Zeiss microscope, Stemi508) at 50 times magnification. A two-way mixed-measures ANOVA was run to determine the differences between the seven brackets placed at six points on the tooth surface.

**Results:** GAC had the smallest overall mean measurement between bracket base and tooth surface followed by Ormco and Gemini respectively, while Abzil had the largest.

**Conclusions:** The results showed that there was no correlation in the space between bracket base and tooth surface amongst the seven brackets. The space was not uniform at all six points of reading for the same bracket between the fifteen teeth.

## Modified Bonded Distal Shoe Appliance Designed for a Patient having Inadequate Abutments: A Case Report

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**Introduction:** Distal shoe appliance (DSA) is an important tool in pediatric dentistry for space maintenance. Typically, when there is a premature loss of the primary second molar, a distal shoe is the choice of appliance for guiding the un-erupted permanent first molar. However, when multiple primary molars of both sides are indicated for extraction, the clinical picture becomes complicated due to lack of adequate abutments.

**Case report:** This case report describes a modification in the distal shoe appliance, that can be used in cases, where there is multiple loss of primary molars. The purpose of the article is to discuss the design and fabrication of a modified distal shoe appliance. In this modified appliance, the primary mandibular incisors were bonded, and the primary mandibular canines were banded which were used as abutments for eruption guidance of un-erupted permanent mandibular molars

**Discussion:** The stainless-steel wire component was soldered to the banded canines and bonded with composite resin to the primary incisors. This wire component provided sufficient strength, support, and stability for the successful eruption of the permanent molar.

**Conclusion:** This modified fixed DSA did not involve any multi-rooted primary molar as an abutment. However, it retained in the oral cavity for 8 months until the eruption of the permanent molar. Hence, it was a successful interim modified distal shoe appliance.

Preventive and Interceptive Orthodontics

## **Management of Early Space Loss by Restructuring Fixed Functional Space Maintainer in a 5-year-old Child: A Case Report**

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**Introduction:** The primary dentition plays a crucial role in a child's growth and development, and is important for speaking, chewing, appearance and for guiding the eruption of permanent teeth. Early loss of primary teeth can lead to malocclusion; hence space management by fixed or removable space maintainer is often required. This paper describes a newer alternative to a conventional band and loop space maintainer and discusses its clinical application.

**Case Report:** A 5-year-old male patient reported to the Department of Pediatric and Preventive Dentistry with a chief complaint of decayed teeth in upper and lower jaws. The left mandibular primary first molar was carious with only root tips present, and hence had to be extracted. Model analysis was done followed by the placement of a fixed functional band and loop.

**Discussion:** Band and loop space maintainers exhibit excellent clinical success in management of space loss, but are not functional appliances. A space maintainer should not only preserve space, but also should facilitate mastication and prevent overeruption of the opposing tooth. This report describes a novel approach for fabricating a functional band and loop space maintainer.

**Conclusion:** This report highlights the use of a band and loop functional space maintainer as a reasonable option for very young children with premature loss of a single tooth. Various modifications of traditional space maintainers can improve masticatory function and preserve arch integrity at same time.

**Malocclusion Impacts Brazilian Children' Oral Health-Related Quality of Life**

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**Background:** Malocclusion is the third most frequent oral health problem in the world, exceeded only by dental caries and periodontal disease. This may lead functional and aesthetic disturbances with psychosocial implications, and quality of life issues.. However, in underdeveloped and developing countries the relationship between malocclusion, esthetics, and quality of life are largely unexplored and orthodontic treatment can be considered a cultural phenomenon mediated by the ability to afford it. The purpose of this study was to assess the impact of malocclusion in the quality of life of Brazilian children.

**Methods:** 328 children aged at 8-14 years, were divided into two groups according to the presence (case) or absence (control) of malocclusion by the Dental aesthetic Index (DAI). Child Perceptions Questionnaires (CPQ8-10 and CPQ11-14) were applied on a face-to face interviews and their domains were assessed [oral symptoms (OS), Functional limitations (FL), Emotional well-being (EW), and Social well-being (SW)]. Individuals with systemic and/or cognitive changes or orthodontic treatment were excluded. Statistical analysis was performed using SPSS 20.0 Program. The scores CPQ8 - 10 and CPQ11 - 14 were calculated by the additive method. To analyze the association between the intensity of the ordinal variables Spearman correlation test was used. The Mann - Whitney test was performed to compare groups.

**Results:** From a total of 328 children, 196 (59.8%) were 8 to 10 years old (mean age, 8.79±0.807 years), and 132 (40.24%) were 11 to 14 years old (mean age, 11.89±1,065 years). No statistically significant differences were noted between case and control groups in terms of age, sex or economical characterization (p=value .237, .239, and .65, respectively). The quality of life of was impacted by malocclusion in both group of ages, 8 to10 (p=0,04) and 11 to 14(p=0,003) mainly on OL and EW domains.

**Conclusion:** Malocclusion had a negative impact on quality of life in Brazilian children and the decline of quality of life was correlated to the severity of malocclusion.

### **Prevalence of Occlusal Disturbances in Children and Guardians' Perception of the Real Need for Orthodontic Treatment**

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**Background:** Malocclusion is still largely neglected in the Brazilian population and, in part, this may be due the lack of knowledge in health education and socioeconomic difficulties. The fact that children always need guardians to seek access to dental care is a limiting factor for children's oral health. Thereby, we aimed at evaluating the prevalence of malocclusion in patients aged 6 to 14 years and the guardians' perception for the need for orthodontic treatment.

**Methods:** For this purpose, 432 medical records of patients who sought treatment at a referral institution in pediatric dentistry were analyzed. Medical records with incomplete data (socioeconomic status, occlusal characteristics) and children with syndromes and / or cognitive changes were excluded. Information on gender, age, number of siblings and main complaint was collected. The need for orthodontic treatment was verified by the Dental Aesthetic Index (DAI, with need levels from 1 to 4).

**Results:** The average age of children (n = 150) was 8.18 ( $\pm$  1.8) years. The most prevalent malocclusion was crowding (34.3%), followed by the anterior open bite (32.8%). The most frequent main complaint was crowding (30.2%). Regarding the need for treatment by the DAI, need level 3 was the most frequent (30.2%). A positive association was observed between the presence of malocclusion and the complaint of those responsible (p = 0.001).

**Conclusion:** Crowding was the most prevalent malocclusion in the studied sample and the perception of those responsible was satisfactory regarding the real needs for orthodontic treatment.

**Chair Side Space Maintainer: Case Series**

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**Introduction:** Though preventive, restorative and pediatric endodontics has come long way in pediatric dentistry but still sometimes we have to decide to prematurely extract a tooth and maintain the space until the permanent teeth erupt. . Space management concepts in paediatric dentistry has hardly undergone any changes and customised space maintainers are still choice of treatment with only the only disadvantage of multiple appointments.

**Case Report:** In this case series total 21 band and loop space maintainers were placed with 11 customised and 10 chair side space maintainer in 9 children aged between 3 to 7 years old. The preformed band selection was done as per tooth size. These bands were spot welded with part B of loop. The loop (Part A) with various sizes were selected, adjusted and crimped. The various factors such as gingival health, de-cementation, breakage of appliance and parents satisfaction were assessed with three, six and 12 month follow up. Out of 10 chair side space maintainer one space maintainer got de-cemented and two chair side space maintainer got de-cemented. Out of 10 chair side space maintainers 3 obstructing erupting premolar and has to be removed immediately.

**Discussion:** The advantage of chair side space maintainer as it can be delivered in same appointment so less time consuming and accepted well by parents. Another advantage is there is no need of impression, band transfer and soldering process. There are certain shortcomings such as loop is not following gingival contour and most important width of loop is very much less as compared to buccolingual width of premolar so regular follow up is necessary. There was no significant difference between gingival health and de-cementation with both types of space maintainer.

**Conclusion:** The chair side space maintainer are less time consuming and more beneficial to the patient and clinician. The same appointment, lack of soldering process are certain advantage. The loop width, necessity of frequent follow with chair side space maintainer are disadvantages . The long term follow-up with large sample size is necessary.

**Previous Dental Cross Bite: Clinical Case Report**

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**Introduction:** Malocclusions are changes in the development of the craniofacial complex that affect the jaws, tongue and facial muscles. They consist of growth and development abnormalities, especially during childhood and adolescence, and can produce aesthetic changes in the teeth or face, and functional in the occlusion. chewing and phonation.

**Case report:** The patient J.S., male, 8 years and 6 months old, presented anterior crossbite of the permanent upper left central incisor (tooth 21), in the mixed dentition in the 1st transitional period. When performing an medical history, it was found that a child exhibited good health, without systemic diseases or allergies and also did not use any medication. The mother reported prolonged retention of the left upper deciduous central incisor, the permanent successor erupted palatally, leading to a cross bite. The cross bite was treated with a removable Hawley`s appliance with finger springs in the region of tooth 21. After two weeks the bite was uncrossed.

**Discussion:** Malocclusions are considered a worldwide public health problem due to their high prevalence. Faced with such problems, it is extremely important that pediatric dentists are trained and qualified to diagnose and treat malocclusions early.

**Conclusion:** The report highlights the importance of early diagnosis of the anterior crossbite, treated with a removable appliance.

# ***Restorative Dentistry***



### **Inhibition of Matrix Metalloproteinase Activity via a Novel SMART Composite Versus Commercial Filling Materials**

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**Background:** Matrix metalloproteinase (MMP) is an enzyme responsible for the degradation of dentine collagen fibrils, leading to interface microleakage. We developed a new antibacterial, remineralising, self-repairing and sealing composite, SMART, that restores primary teeth painlessly. This study aimed to quantify MMP activity at the surface of demineralised dentine following sealing by SMART composite versus commercially available restorative materials.

**Methods:** 2mm thick sections of coronal dentine from sound human molars, obtained following ethical approval, were fully demineralised through 4M formic acid immersion for 48hrs. Following green fluorescent probe application (EnzCheck Collagenase Assay Kit) for 5 minutes, restorative materials were applied on one surface. Materials included SMART (Schottlander), 3M ESPE Filtek Z250, ACTIVA KIDS Bioactive compomer (+OptiBond Solo Plus adhesive) and GIC Fuji IX, according to the manufacturer's instructions. Non-restored dentine was used as control. Samples were stored in deionised water and incubated at 37°C. Following 1 or 14 days, samples (n=4) were sectioned, and the interface area imaged using Confocal Light Scanning Microscopy (CLSM). The percentage area of green fluorescence in sections 260x260µm<sup>2</sup> MMP activity was determined through ImageJ.

**Results:** SMART restoration had the least fluorescence initially (0.5%), which after 14 days almost totally disappeared. Z250 and ACTIVA results were similar after incubation at day 1 (2.5%-2.0%) and day 14 (2.0% 1.8%) respectively. MMP activity of GIC (Fuji IX) was lower than Z250 and ACTIVA on day 1; however it was significantly higher at day 14, reaching 3.5%.

**Conclusion:** Sealing of demineralized dentine by SMART composite substantially reduced MMP enzyme activity. We have shown that the novel SMART composite can be an effective option in restoring carious primary teeth.

**Pediatric Edelweiss Crowns: A New Aesthetic Option**

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**Introduction:** Esthetic management of early childhood caries is usually catered by veneered stainless steel crowns, preformed strip crown forms or zirconia crowns. Although zirconia crowns provide a life-long appearance but it is maximally invasive amongst all the options. Edelweiss pediatric crowns or the preformed laser sintered composite crowns is a viable option.

**Case report:** A case series of twenty five Edelweiss pediatric crowns were placed by a single operator. All the cases needed crown due to tooth destruction caused by early childhood caries. The cases have follow-up period of 12-24 months.

**Discussion:** Edelweiss pediatric crowns are biocompatible and have physical properties closer to that of the natural tooth structure. The Edelweiss pediatric crown perfectly imitates natural milk tooth in both form and function. More importantly, they are less invasive than the zirconia crown. The disadvantage is that they are technique sensitive.

**Conclusion:** Edelweiss pediatric crowns are a good option for esthetic replacement of teeth affected by early childhood caries.

**Intercept Early or Live to Regret it!**

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**Introduction:** A deep overbite (Akerly I, II and III) can cause soft tissue trauma leading to pain, tooth wear and lack of inter-occlusal space. Treatment options can range from simple provision of a removable appliance to multidisciplinary management involving orthodontics and orthognathic surgery. This poster will highlight how patients with traumatic periodontal contacts and missing posterior teeth can benefit from a partial denture with an anterior bite platform (ABP).

**Case report:** This case report presents 3 examples of patients with traumatic deep overbite who benefitted from a rehabilitation option using ABP. By allowing contacts on the platform and not periodontal tissue, ABP provides pain relief, resolution of lateral periodontitis and restoration of function. Additionally, ABP can be designed to be perforated to prevent the metal shining through in cases with anterior diastema.

**Discussion:** Definitive methods of reducing a deep overbite may involve a combination of head gear with orthodontic fixed appliance, and/or orthognathic surgery with mandibular advancement. Factors such as history of tooth loss, lack of posterior occlusal support, migration of maxillary incisors and over-eruption of the lower incisors causing a deranged occlusal plane can limit restorative options. Symptomatic management using occlusal splints or denture at increased occlusal vertical dimensions (OVD) can be effective at relieving the occlusal trauma that leads to tooth wear and pain.

**Conclusion:** ABP can be a practical solution for patients with traumatic overbite who are not able to tolerate more advanced or invasive treatment options.

**Enamel Hypoplasia of Permanent Successors due to Dental Trauma in Primary Teeth : Three Case Reports**Bilal Özmen, Şeyma İrem Küçük*Faculty of Dentistry, Department of Pediatric Dentistry, Ondokuz Mayıs University, Samsun, Turkey*

**Introduction:** Developmental defects in permanent teeth usually occur as a result of trauma in the primary teeth. Pulp necrosis, tooth discoloration, enamel hypoplasia, ectopic eruption, crown dilacerations can occur on permanent teeth. The purpose of this report is to present the effects and treatments of trauma to primary teeth on their permanent successors.

**Case 1:** An eight years old boy patient's left maxillary central incisor tooth had hypoplasia. Radiolucency was observed on the affected tooth's crown by radiography. Patient's parents reported a history of trauma at the age of two years. As treatment an aesthetic restoration with resin composite was performed.

**Case 2:** An eight years old girl patient's right maxillary central, lateral incisor teeth had hypoplasia. Her parents told a history of trauma at the age of eighteen months. Aesthetic restorations were planned but patient's parents didn't want the treatment.

**Case 3:** A twelve years old girl patient's parents told a history of trauma at the age of two years old. Due to that, her permanent left mandibular three anterior teeth became hypoplastic. Radiographic observation showed radiolucency on the affected teeth's crown. Aesthetic restorations were performed.

**Discussion:** Traumatic primary teeth can cause hypoplasia on the permanent teeth. Direct composite veneer can be used as treatment in enamel hypoplasia. This is easy to apply and repairable. Teeth with a developmental anomaly can also be treated using crowns.

**Conclusion:** Functional and aesthetic needs of patients can be provided by treating hypoplasias in permanent teeth due to trauma to primary teeth.

**Immature Permanent Tooth with a Horizontal Root Fracture: Short Term Follow-Up**

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**Introduction:** Root fractures are rare in trauma cases. Horizontal root fracture occurs often in the middle-third of the root and rarely at the apical-third and coronal-third. In root fractures, the prognosis varies depending on the age of the patient, the stage of root development, the level of the fracture line.

**Case report:** An eleven-year old patient fell on the carpet in the school corridor and presented to our clinic three hours later. There were no medical problems in the history of the patient. In the intraoral examination, tooth number 11 had bleeding in the form of leakage, sensitivity in horizontal percussion and 1 mm extrusion. There were uncomplicated crown fractures in teeth 11 and 21. When examined radiographically, horizontal root fracture was observed in the middle 1/3 of the tooth number 11. After local anesthesia the affected tooth was repositioned with with finger pressure at the first session. A splint was made between teeth number 13-23. After 4 weeks, the splint was removed. With the clinical examination, it was observed that the affected teeth received positive responses to vitality tests. Aesthetic rehabilitation of teeth 11-21 were performed with composite.

**Discussion:** It is important to apply clinical and radiographic examinations, vitality tests and inform the patient about oral care in the diagnosis and treatment of dental trauma.

**Conclusion:** In dental trauma cases, early diagnosis affects prognosis. Improvement in pulp tissue can be followed by vitality tests. Endodontic treatment may not be required for teeth that maintain their vitality.

## Management of Complicated Crown-Root Fracture with Pulp Exposure in Permanent Central Incisor: A Case Report

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**Introduction:** Crown-root fracture with pulp exposure is a fracture involving enamel, dentin, and cementum and exposing the pulp. According to the tooth's situation appropriate treatment could be planned. The principal aim of orthodontically extrusion of fractured tooth is to provide a supra-gingival tooth margin as it can be restored without impinging to periodontium and isolation faults.

**Case report:** 11 year-old boy patient attended our clinic 10 hours after the trauma incident. He fell at school and had a trauma in left permanent central incisor. In clinical examination, the pulp was exposed, palatal fragment was mobile and the fracture line reached to the root surface. In radiographic evaluation, there was no apical radiolucency or fracture on 2/3 apical region of root. The mobile fragment was removed and the root canal treatment was done in one visit. Because of the poor isolation for restoration, the orthodontic extrusion was planned for the traumatized tooth. The braces were applied in first visit as a splint. The permanent restoration was applied and then finally the retainer was bonded to palatal region of incisors. After clinical and radiographical evaluations done in 1,3,6,12,24 month follow-ups, there is no sign of radiolucency, resorption, discoloration, mobility or abscess.

**Discussion:** After orthodontically extrusion, the isolation can be ensured for the appropriate restoration. The disadvantages of the orthodontically extrusion are the esthetic concerns and long treatment period.

**Conclusion:** Orthodontic extrusion is a non-invasive and mostly reliable choice in crown-root fractures. Children also can tolerate the treatment and cooperate with the practitioner.

## Evaluation of the Bond Strengths of Restorative Materials to Primary Tooth Dentine Treated with Different Pulpotomy Techniques

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**Background:** The aim of this study is to investigate the changes of different pulpotomy techniques on the primary tooth dentine and to evaluate the effects of these pulpotomy methods on the shear bond strength of restorative materials to primary tooth dentine.

**Methods:** Dentin specimens were distributed randomly to the study groups as: control, ferric sulphate, Biodentine, laser (Nd:YAG), photobiomodulation and atmospheric pressure cold plasma. After the application of pulpotomy methods, samples were again randomly divided to two different restorative materials. Then shear bond strength (SBSs) test was performed using the universal test machine. Additionally, new dentine specimens were prepared for each group for further surface analysis (with SEM).

**Results:** According to the results of this study the mean SBSs values of the groups which applied composite material were statistically significantly higher than the groups which applied glass hybrid material ( $p < 0.05$ ). Furthermore, a statistically significant difference was obtained among all study groups for both restorative materials ( $p < 0.05$ ). While the highest mean SBSs value was obtained with laser group ( $7.58 \pm 0.60$ MPa), the lowest value was observed with Biodentine group ( $6.70 \pm 0.91$ MPa) ( $p = 0.001$ ) for glass hybrid material. For composite material the highest mean SBS value was calculated for laser group ( $13.79 \pm 1.24$ MPa), while the lowest value was obtained with ferric sulphate group ( $10.17 \pm 1.45$ MPa) ( $p = 0.001$ ). Moreover, morphological changes were observed with SEM on the dentine surfaces of ferric sulphate, Biodentine and laser groups.

**Conclusions:** Nd: YAG laser and ABSP applications increased the shear bond strength values in both groups of restorative materials. In the selection of the restorative material to be used after the application of Biodentine, composite resins can be preferred in terms of shear bond strength values.

## Evaluation of Gap Formation for Different Adhesive Systems in Primary Teeth with Optical Coherence Tomography

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**Background:** This study aimed to evaluate gap formation between the tooth surface and restorative material in terms of microleakage by using Optical coherence tomography (OCT) for self-etch and selective-etch applications of two different universal and one self-etch adhesive systems with the hypothesis that selective-etch would reduce gap formation more than self-etch regarding the type of adhesive was not a contributory factor in gap formation.

**Methods:** Sixty non-carious, primary molar teeth were evaluated in six different groups as; self-etch and selective-etch application ways of two different universal and one self-etch adhesive systems (n:10). After Class-V cavities were prepared, every tooth was distributed randomly in groups to apply adhesion procedure and all cavities were restored with polyacid-modified resin composites. Then, microleakage was evaluated by measuring the gap between the tooth surface and restoration by a blind researcher with Image J Software from OCT images. During statistical analysis, significance level was accepted as p 0.05.

**Results:** According to the statistical analysis of the measurements obtained by Image J Software, Group 5 had significantly highest results for gap formation amongst all groups in terms of gap measurements. Also, selective-etch groups showed less gap formation than self-etch groups for each tested adhesive.

**Conclusion:** Selective-etch and universal adhesive application can be preferred to restore primary teeth with polyacid-modified resin composites by pediatric dentists. However, obtained results should be considered with prospective clinical studies for long-term prognosis.



**Composite Endocrown Restoration of Excessively Mutilated Endodontically Treated Teeth**

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**Introduction:** Restoration of endodontically treated teeth with excessive crown damage is extremely challenging. The success of the coronal restoration is directly related to the clinical success of the endodontically treated tooth. Conventional post and core restorations have some disadvantages such as the preparation of the healthy dental tissues as well as post and root fractures. For this reason, more conservative treatment alternatives have been suggested. The aim of this report is to present a case with endocrown restoration as an alternative treatment method for the restoration of badly mutilated endodontically treated teeth.

**Case report:** A 13 years old male came to our clinic accompanied by his parents with a complaint of pain in the lower left posterior area. On examination, tooth 36 with excessive substance loss was found to be the cause. After performing root canal treatment, composite endocrown was planned for coronal restoration. The tooth was prepared and impression was taken. After pouring the model, composite restoration was made. On the second visit, endocrown restoration was cemented using glass ionomer cement.

**Discussion:** In this case, after a 1-year follow up, endocrown restoration was found to be aesthetically and functionally successful. Endocrown restorations are recommended as an alternative to conventional post and core restorations especially in teeth with short clinical crowns where the ferrule effect is inadequate.

**Conclusion:** Endocrown restorations conforming to minimal invasive principles can be used as an alternative treatment option to conventional post and core restorations in restoring badly mutilated endodontically treated teeth.

**A Case Report of Resin Infiltration used with a Modified Protocol on a Hypoplastic Enamel**

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**Introduction:** Enamel microabrasion associated with resin infiltration offers a new treatment solution for clinical situations in which white spots have a deep or mixed topography.

**Case Report:** A case involving hypoplastic enamel on teeth 6, 7, 8, 9, 10, 11, of a 17-year old, male patient treated using the modified protocol of resin infiltration with microabrasion and ICON infiltration. The case selection for which the protocol is suited was made using visual inspection and transillumination to establish the depth of the enamel defects. Opalustre material was used to perform the microabrasion, which offers a mechanical and chemical treatment consisting of silicon carbide particles and 6.6% hydrochloric acid, used together with Opalcup. The infiltration was performed with the Icon Vestibular® DMG kit consisting of three syringes containing 15% hydrochloric acid, ethanol and low viscosity resin.

**Discussion:** The advantages of this type of treatment includes total masking of enamel defects, single visit treatment, atraumatic with high aesthetic success rate. The possible disadvantage would be that the treatment result depends on the defect`s depth.

**Conclusions:** Resin infiltration with microabrasion represent a modern solution for molar incisor hypoplasia, fluorosis and isolated enamel hypomineralizations.

### Biological Restoration of Posterior Primary Teeth:– Case report

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**Introduction:** Currently, several materials and techniques are used in the reconstruction of primary teeth, such as: composite resins, glass ionomer cement, metalloplastic restorations and steel crowns. No material fully recovers aesthetics and functionality compared to dental structure. With tooth banks and the adhesive characteristics of restorative materials, the use of dental fragments or exfoliated teeth has been an option. Restorative alternatives are important for our patients.

**Case report:** The presente work describes the step-by-step technique and the adaptation of exfoliated natural teeth in rehabilitation of major coronary destruction of posterior primary teeth.

**Discussion:** The use of natural tooth bank for rehabilitation appears as a restorative option, biologically more compatible, as it uses restorative material from enamel and dentin. Biological restoration is a more correct term to refer to this technique, because uses fragments adapted to the remaining tooth. Its adhesion is through adhesive systems promoting adhesion of tooth structures and tooth friction.

**Conclusion:** the employed restoration technique is a simple, fast and low-cost procedure that allowed aesthetical and functional rehabilitation of the lost anatomic structures, providing good marginal adaptation and excelente polishing.

Growth and Development, Oral Medicine and Pathology, Restorative Dentistry

### **Maxillary Orthopedic Evaluation in a Pediatric Patient with Osteomyelitis Sequelae**

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**Introduction:** Osteomyelitis (OS) is an infectious condition where bacteria permeate through different osseous surfaces, cause local damage, and can affect a patient's general wellbeing. The prevalence of this condition in the maxillary bones in pediatric patients is 1%, which makes its appearance rare, and its management complex.

**Case Report:** A 3-year-old patient was assessed with the presence of an abnormal, asymptomatic growth site in the lower right maxillary region. Upon clinical observation, an increase in volume of approximately 6 cc of the posterior region of tooth 8.4, with bland consistency, and no apparent infectious sites were observed. Upon radiographic assessment, irregularly bordered radiolucent zones in the mandible were observed. The patient was referred and treated in a local hospital, where a MRSA Osteomyelitis diagnosis was confirmed. A year after the surgical treatment, an adequate evolution with an active bone formation zone was observed. In the first phase of maxillary orthopedic assessment, it is decided to tackle the present atypical swallowing, to posteriorly continue with an occlusal rehabilitation.

**Discussion:** Oral rehabilitation in a maxillary affected OS patient represents a challenge due to the vast osseous destruction in the affected site. Proper bone formation must be awaited until rehabilitation can be continued, and this should all be planned, having the patient's biopsychosocial development in mind. The present patient's age allows for early correction and prevention of further developmental consequences.

**Conclusions:** OS sequelae are a challenge due to the destructive nature of the pathology, which interrupts adequate development and therefore causes intermaxillary disharmony.

## **Rehabilitation in Temporary Molars through the use of Preformed Metal crowns in a Patient with Severe Early Childhood Caries: Case Report**

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**Introduction:** Severe early childhood caries (S-ECC) is highly prevalent among Chilean children, causing a public health problem. There are different treatments to restore the functionality and aesthetics of tooth lost due to this, having among the options the use of composite resins and preformed metal crowns. The objective of this clinical case is to present the complex restorative treatment of a patient by the use of preformed metal crowns, achieving functional rehabilitation.

**Case report:** Informed consent was signed. Patient 4 years 3 months, Frankl scale 2, fistulas, S-ECC. Upon clinical examination due to the severe coronary destruction of the teeth, the restorative treatment was based on composite resins, glass ionomers, aesthetic anterior front and preformed metal crowns in the lower molar sector.

**Discussion:** In order to rehabilitate S-ECC lesions, multiple treatments have been described. Each of them with advantages and disadvantages. The Chilean reality makes these experiences take into account to define a treatment option in addition to the patient's individual risk.

**Conclusion:** S-ECC constitutes a Public Health problem in Chile. There are various rehabilitative treatments, but it has been seen in the literature that for the treatment of severe destruction due to extensive caries lesions, especially in molars, the Gold Standard for these situations is the use of preformed metal crowns, which have excellent results.

**Evaluation of Masticatory Efficiency of Children with Stainless Steel Crowns: A Pilot Study**Madhura Sen<sup>1</sup>, Karuna Mahabala<sup>1</sup>, Srikant Natarajan<sup>2</sup><sup>1</sup>*Pediatric and Preventive Dentistry, Manipal College of Dental Sciences, Mangalore, Manipal Academy of Higher Education, Manipal, Mangalore, Karnataka, India*<sup>2</sup>*Oral Pathology, Manipal College of Dental Sciences, Mangalore, Manipal Academy of Higher Education, Manipal, Mangalore, Karnataka, India*

**Background:** Stainless steel crowns are commonly used to restore posterior teeth of children and over the years, they are available with improved anatomical shape. The purpose of this study was to evaluate the effect of placement of stainless steel crowns on the masticatory efficiency of children.

**Methods:** This was a cross-sectional split mouth study conducted on 6-11 years old 15 children with seated stainless steel crowns on one or more teeth on only one side of the mouth. Two flavours (red and green) of the same brand of chewing gum were used. The child was asked to chew half a strip of red and green chewing gum placed one on top of the other using either non-crown or crown side 15 times. Another set of chewing gum was given to the child to chew for 20 times using the same side. The chewing exercise was repeated using teeth on the other side. The chewed gums were collected, photographed and analyzed using Image J software. The calculated masticatory efficiency was further analyzed using SPSS 20.0.

**Results:** On comparison of the mean values of crown side with the non-crown side following 15 chewing cycles, chewing efficiency on non-crown side was higher with a difference of 0.303, while the same following 20 chewing cycles was higher on crown side with a difference of 0.814. However, both the differences were statistically non-significant ( $p=0.94$  and  $0.80$  respectively).

**Conclusion:** Placement of stainless steel crowns on molar teeth of children did not alter the masticatory efficiency.

**Aesthetic Trauma Restoration using a New Technique of Individualized Celluloid Matrix and Flow Resin**

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**Introduction:** Dental trauma is a problem that affects mainly anterior teeth due to falls in play. Such fractures directly affect the child's quality of life with the aesthetics compromise and increase in bullying, so correct diagnosis and restorative treatment are important. The purpose of this case report is to present an aesthetic restoration using an individualized celluloid matrix (ICM).

**Case Report:** 9 years old child, attended the FOB-USP Pediatric Dentistry clinic two days after the trauma, clinical and radiographic examines was made and the diagnosis was enamel fracture without pulp exposure of element 11 and no periapical lesions. The treatment of choice was ICM for restauration. First the patient arc was molded and a wax restoration was made, then the new model was used to make the ICM. The tooth was prepared followed by and color and resin selection: Beautiful Flow Plus A2 SHOFU®. Adjacent teeth were protected, ICM was tested and adapted. The ICM was filled with the resin and taken into position, excess was removed and resin was light-cured. After, ICM removal occlusal adjustments were made. After 7 days, the patient returned for control and polishing.

**Discussion:** ICM associated with flow resins provide an aesthetic and functionally satisfactory restoration, a shorter clinical time, that leads to a decrease in patient discomfort providing a better conditioning.

**Conclusion:** This report case showed that treatment with an ICM associated with a flow resin of Shofu® is an excellent alternative for the pediatric dentist, with excellent rehabilitation of the patient.

**Smart Resin Infiltration: A Quantitative Light-induced Fluorescence based Evaluation of Dental Fluorosis**

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**Background:** Moderate dental fluorosis comprising both stained and unstained areas have always been esthetically objectionable among individuals. Since restorations lead to a death spiral, micro invasive techniques are needed for its management. The aim of this study was to evaluate two intervention protocols: microabrasion with resin infiltration and microabrasion with remineralization and assess which brings about more fluorescence gain; better color masking and greater patient satisfaction among subjects with dental fluorosis.

**Methods:** Sixty children with Grade 3 Dental fluorosis (Dean's Fluorosis Index) with stains and 60 children without stains were subjected to microabrasion followed by either resin infiltration or remineralization. At baseline, post-microabrasion and post-intervention fluorescence gain ( $\Delta F$ ) was analysed. Post-intervention colour difference ( $\Delta E = [(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$ ) and child satisfaction was evaluated (Visual Analog Scale). Collected data was analysed using repeated measures /One- way ANOVA and Independent t test.

**Results:** Intra group comparison of  $\Delta F$  values across different time interval showed statistically significant improvement in  $\Delta F$  value in all the four groups ( $p < 0.001$ ,  $0.002$ ). Inter group comparison of  $\Delta F$  values based on intervention showed statistically significant fluorescence gain ( $p < 0.004$ ) indicating resin infiltration intervention being better than remineralization in unstained grade III fluorosis. The color difference was statistically significantly better with resin infiltration in both stained and unstained Grade III Dental Fluorosis ( $p < 0.001$ ).

**Conclusion:** The combination technique of microabrasion with resin infiltration showed significantly better fluorosis gain and colour masking compared to microabrasion-remineralization. These outcomes will aid in selecting appropriate minimally invasive intervention for esthetic management of moderate dental fluorosis in children.



### Survival of Different Restorations in Primary Molars

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**Background:** High caries experience in pediatric population needs effective, esthetic and long-lasting treatment. Conventional restorative materials can be a good alternative for primary molars restorations. The aim of this study was to evaluate survival of different restorations in primary molars and associated risk factors of failure.

**Methods:** 437 primary molars of 84 children 4-8 y.o. were restored. They were randomly allocated to 4 groups according to restorative protocol: glass ionomer cement (GI); resin composite/two-step etch&rinse adhesive (RCER); resin composite/self-etch adhesive (RCSE) and compomer/self-etch adhesive (CSE). The restorations survival was assessed using Kaplan-Meier survival test. Multivariate Cox-regression analysis was used to evaluate risk factors associated with failure ( $p < 0.05$ ).

**Results:** After 24 months 312 restorations were assessed. Survival of restorations was 70.2% for GI, 89.0% for RCER, 80.6% for RCSE and 78.5 for CSE, with annual failure rate 19.19%, 5.5%, 10.24%, 11.42%, respectively. Secondary caries, partial/complete restoration loss and endodontic complications were the most frequent reasons of failure. Restorations in high caries risk group (HR=3.337; 95% CI 1.307-8.520;  $p=0.012$ ) or on the proximal surfaces (HR=2.951; 95% CI 1.444-6.033;  $p=0.003$ ) had significantly higher risk of failure. Rubber dam use (HR=0.399; 95% CI 0.207-0.771;  $p=0.006$ ) and resin composites (HR=0.357; 95% CI 0.169-0.754;  $p=0.007$ ) decreased risk of failures. Age, oral hygiene, endodontic therapy hadn't influence on failure rate.

**Conclusions:** Several factors (caries risk, rubber dam, proximal cavities, restorative protocol type) affect the survival rate of primary molars restorations. Using resin composites with etch&rinse adhesives in combination with proper handling and caries control may provide the lowest failure rate in primary molars.

**Full Pulpotomy with MTA of a Young Permanent Teeth: A Case Report**

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**Introduction:** Full pulpotomy is a treatment approach for the management of inflamed dental pulps exposed due to caries or trauma, especially for young permanent teeth. With full pulpotomy, removing the inflamed coronal pulp and covering the remaining radicular pulp with a biomaterial, promotes the healing of the radicular pulp. Due to this technique we can maintain the pulp vitality and ensure that the root development continues with the formation of hard tissue barrier on the exposed pulp surface.

**Case Report:** A 12-year old female patient with exposed pulp due to caries in left maxillary first permanent molar was treated with full pulpotomy with MTA. Clinical and radiographic examinations were performed at first, 3rd, 6th, 12th months. At the end of 12th month tooth was asymptomatic and showed no clinical and radiographic signs of infection or inflammation.

**Discussion:** Root canal treatment for teeth with exposed pulp can be considered for prophylactic purposes but it can't maintain vitality. Pulpotomy is a vital pulp therapy procedure and it is more favorable than root canal treatment. With the development of biomaterials the success rate of this treatment method has increased. But, if the procedure fails it is necessary to remove MTA and perform root canal treatment. Therefore choosing the right case is important for long term success.

**Conclusion:** Full pulpotomy with MTA showed clinical and radiographic success after one year. There were no clinical signs and symptoms of irreversible pulpitis for the treated tooth.

**The use of High-intensity Laser Therapy (HILT) in Gingivectomy of the Permanent Molar**

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**Introduction:** Ulectomy is the excision of tissue lining the face incisal or occlusal surfaces of the dental crown of unerupted tooth. The treatment of choice could be the use of high-intensity laser therapy (HILT) that contributes to the performance of a minimally invasive surgery, due to its excellent hemostatic properties and the reduction of lesions in adjacent tissues.

**Case report:** A 12-year-old male patient attended the FOB-USP pediatric dentistry clinic to restore tooth 46. After medical history, clinical and radiographic examination of the region, it was observed the need for a gingivectomy to expose the crown of the tooth 47, for correct observation of the contact area between the teeth. Topical and infiltrative anesthesia was performed only on the mucosa to be removed. Then, with the laser in its pre-programmed function for soft tissue surgery, the gingivectomy surgery was performed. After the procedure, with the bleeding-free region, an initial adjustment in the inter-proximal region of the teeth can be made in order to restore the tooth 46. After seven days the patient returned to control, there was no report of postoperative pain, the region was well healed to continue the restorative process.

**Discussion:** The gingivectomy procedure realized with HILT (Thera Lase Surgery - DMC), helped to minimized the blood in the region, searing the remaining tissues, promoting a faster recovery for posterior precedents, also had less post-operative discomfort of the patient.

**Conclusion:** HILT application in gingivectomy surgeries had many advantages for the operator and the patient.

**Moderate Incisive Molar Hypomineralization: Rehabilitation Technique Proposal**

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**Introduction:** Molar-Incisor - Hypomineralization (MIH) is characterized by presenting opacities, posteruptive enamel loss, sensitivity, atypical fillings and premature loss. In Mexico, its prevalence is 15.8%, incidence of 2:10 cases. The current treatment is based on block glass ionomers due to its high resistance and fluoride release; however the longevity of the restorations is short.

**Case report:** 8.3 year old patient with a history of fetal tachycardia at 40 weeks gestation presented at the pediatric dentistry clinic for pain during tooth brushing. Clinically it presents moderate MIH of #46. Treatment 1st Appointment: a working model in plaster was obtained, to wax and reproduce the lost occlusal anatomy, then its impression was taken with silicone to obtain a working guide. 2nd Appointment: local anesthesia, absolute isolation, removal of active carious tissue and washing with 0.5% hypochlorite for 1 minute was performed; The silicone guide was adjusted, the surface was subsequently engraved for 16 seconds, the glass ionomer was placed using the silicone guide for 2 minutes and removed. No termination procedure was necessary.

**Discussion:** The advantage of the proposed technique was savings in clinical work time. In addition to maintaining the properties offered by the glass ionomers such as chemical adhesion, fluoride release, tooth-like elastic limit and wear resistance.

**Conclusions:** The rehabilitation of the tooth with moderate molar incisor hypomineralization, by placing the block glass ionomers with a silicone guide, was able to restore esthetics and function immediately.

## Comparison of Conventional Instrumented and Alternative not Instrumented Treatment in Pediatric Dentistry: Case Report

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**Introduction:** Pulpectomy has been used as a treatment for deciduous teeth with irreversible pulp damage and the nickel-chromium crown as a restoration afterwards. Currently there are alternatives to this pulp treatment such as CTZ, an antibiotic paste composed of chloramphenicol, tetracycline, zinc oxide and eugenol, also called not endodontic instrumented and for Cention N filling, a restorative, a esthetic, radiopaque filler that releases fluoride, calcium and hydroxide ions.

**Case report:** A 6.6 year old female patient with a negative medical history, oral diagnosis of pulp necrosis in 55 and 65 and carious lesion grade 06 according to ICDAS. Teeth were fully restored : a pulpectomy with vitapex and nickel-chromium crown was performed in the 65 and CTZ and Cention N paste in the 55. Follow-up with clinical and radiographic comparison was performed at 3 months with favorable results in both treatment options.

**Discussion:** Since pulpectomy in primary teeth is sometimes difficult to perform, non-instrumented endodontic treatment with CTZ is proposed as an innovative biological approach that can be successfully applied in children. The use of the nickel-chrome crown as a restoration after pulp therapy has been highly effective, but sometimes it does not give the required aesthetics, in addition to the excessive tooth preparation it requires. Cention N is a great aesthetic alternative as it allows the release of fluoride, calcium and hydroxide ions to regulate the pH values and therefore promotes the enamel remineralization.

**Conclusion:** Conventional and alternative management in the rehabilitation of primary teeth with necrosis gave favorable results in the case presented.

Cariology and Preventive Dentistry, Restorative Dentistry

### **Effect of Restorative Materials against Erosive and Abrasive Wear and their Influence on Adjacent Dental Enamel: An In Situ Study**

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**Background:** Erosive tooth wear may need dental restoration in case of pain or when function and aesthetics are compromised. The objective of this study was to evaluate the behavior of ionomeric materials (CIV), and composite resins (CR) with and without Giomer technology, considering the wear of the material and the adjacent enamel, when exposed to erosive/abrasive challenge.

**Methods:** This randomized, single-blind *in situ* study was conducted with 3 crossover phases of 5-day. Bovine enamel blocks (n=240) were allocated to 10 volunteers and 12 groups. The materials under study were: CR Beautiful II® (GB); CR Beautiful Bulk Restorative® (GBB); CR Filtek™ Z250XT (GF); CR Filtek™ Bulk Fill Flow® (GFB); CIV EQUIA® Forte (GE); CIV RIVA light-cure®(GR). Half of the enamel blocks were subjected to erosion and the other half to erosion plus abrasion. The restorative material was applied in artificial cavity following the manufacturer's instructions. The daily extraoral erosive attack consisted in 4 immersions in citric acid (2min); followed by abrasion with electric brush in half of blocks. The response variable was enamel and material loss by profilometry. Data were analyzed by three-way ANOVA and Tukey's test (p0.05).

**Results:** All materials suffered from wear, with GB=GBB=GF=GFBGE

**Conclusion:** The studied materials suffered higher wear when erosion was associated to abrasion, CR were less susceptible to wear and none of the materials had protected the adjacent enamel.

### Use of Papacárie® in Chemical-Mechanical Treatment in Child Patients: Case Report

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**Introduction:** To reduce the inconvenience of the conventional method of removing caries, a chemical and mechanical method was created to remove the deteriorated tissue, using a blue papain, chloramine and toluidine gel called Papacárie®, which works by smoothing only the carious dentin and facilitating removal, preserving healthy dental tissue. The present work describes the technique of using Papacárie® in the chemical-mechanical treatment of pediatric patients, demonstrating its use protocol.

**Case report:** Two patients, 5 and 7 years old, presented with caries lesions. After applying the gel, we waited 40 to 60 seconds for healing the infected tissue and then the cavity was washed with water. After chemical-mechanical removal of the decay, the teeth were restored with flow resin and glass ionomer cement.

**Discussion:** Conventional caries removal therapy increases the possibility of excessive cavity preparation, wears out healthy tissue, generates dental heating, stimulates pain, exerts pulp vibration, increases the chances of exposure and is considered noisy due to the use of high exercise speed. On the other hand, the technique in which Papacárie® is used does not require anesthesia and only the manual use of blunt curettes is necessary, which favors the preservation of healthy tissues and more comfortable patient care. In the present cases, the infected tissue was easily removed and the cavities sealed satisfactorily by the operator.

**Conclusion:** This therapeutic proposal proved to be efficient for these cases, showing the importance of alternative treatments to conventional ones in the removal of caries in the context of pediatric dentistry.

### **Effect of GC Tooth Mousse Plus Application on the Bond Strength of Glass Ionomer Cement and Composite Resin on Permanent Teeth: An In-Vitro Study**

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**Background:** The Casein Phosphopetide- Amorphous Calcium Phosphate Fluoride is a potent remineralizing agent causing addition of cariostatic ions, which may alter the porosity of the tooth structures and influence the bond strength. The efficacy of the type of restorative material needs to be investigated for sustainable restorations.

**Methods:** The study was conducted on thirty-two extracted premolars which were divided into four groups of eight teeth each. Samples of Group A were restored with GIC type IX, in Group B GC Tooth Mousse Plus was applied and restored with GIC type IX, in Group C composite restoration was done and in Group D, GC Tooth Mousse Plus application was followed by composite restoration. The specimens were subjected to thermocycling for 300 cycles, followed by determination of shear bond strength using Instron Universal testing machine at a crosshead speed of 1mm/min and load of 50kg.

**Results:** The mean shear bond strength was highest in group C, restored with composite ( $4.84 \pm 0.051$ ) followed by group A with GIC restoration ( $4.23 \pm 0.72$ ) followed by group D ( $1.57 \pm 1.06$ ) and group B ( $0.87 \pm 0.72$ ) restored with composite and GIC respectively after GC Tooth mousse plus application.

**Conclusion:** The CPP-ACPF affects the bond strength of restorations significantly and the shear bond strength of composite resin is higher in comparison to GIC.



Dental Trauma, Endodontics, Restorative Dentistry

## **MTA Pulpotomy and Putty Index Technique for Management of Complicated Crown Fractures in Young Permanent Incisors: A CASE Report**

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**Introduction:** Management Complicated crown fracture in a young permanent tooth with an open apex is indeed a challenge to the practitioner. A procedure that will maintain the vitality of the tooth, promote root development, followed by a definitive restoration that will not only restore the form of the tooth but also the confidence of the child is mandatory. This case report describes the successful rehabilitation of such a case with follow up

**Case report:** A 11 year old boy reported with fractured central incisors, the day after trauma. The left incisor showed a pin point exposure, while the right showed no evidence of exposure. Both had open apices. An MTA pulpotomy to promote apexogenesis was done on 21 and an alginate impression of the patient was made. A wax mockup of incisors to the desired form was achieved on the cast and a putty index was made. At the next appointment a composite restoration was done for both the incisors using this index.

**Discussion:** Success depends on the time at which treatment is initiated after trauma and the material used. Also, due to the inability to achieve isolation immediately post trauma; putty index technique comes handy, where a good form can be established for the tooth on the cast and the patient can be called later for rehabilitation when hemostasis and isolation can be achieved.

**Conclusion:** MTA pulpotomy followed by putty index technique for restoration is a good option for managing traumatized young permanent teeth with crown root fractures.

### **Crown Fragment Reattachment in Anterior Fractured Teeth**

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**Introduction:** Crown fractured are the most frequent traumatic dental injuries in children. Reattachment of the fractured fragments can be attempted in cases which the coronal segment is available and there is no or minimal violation of biological width.

**Case report:** Eight patients ( two girls and six boys ) aged between 8-11 years were referred to the Istanbul University Faculty of Dentistry Department of Pediatric Dentistry. The patients had coronal fractures in their maxillary incisor teeth and all had the fractured incisal fragments. Four of these teeth were stored in milk, one of these were stored in water and three of these teeth were stored dry. The fractured tooth fragments stored in serum physiologic for rehydration. In incisal fragments internal dentin groove was prepared with high speed burs. The fractured surfaces were etched with %37 phosphoric acid then rinsed, dried and applied bonding agent without light curing. Composite resin was applied to the fragments and the tooth surfaces. Then the fractured segments were accurately placed on the teeth. When the original position had been re-established, excess resin was removed, and they were light cured for 40 seconds. The teeth were finished and polished with finishing instruments and polishing discs. Clinical and radiographic follow-ups were regularly over a year.

**Discussion:** The reattachment of a crown fragment seems to be a practical alternative to placement of conventional composite resin restorations in the management of fractured anterior teeth, as this method is simple, conservative, and provides satisfactory fragment retention and esthetics. It also ensures complete restitution of the tooth's integrity.

**Conclusion:** Reattachment of fractured tooth fragments can provide good and long-lasting esthetics because the tooth's original form can be maintained. Chair time for the completion of the restoration is minimal. It is important the inform the public about storage conditions of fractured fragments.

### Managing Carious Lesions in Primary Teeth in COVID-19 Pandemic

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**Background:** Coronavirus disease is a severe acute respiratory infection caused by an RNA virus, SARS-CoV-2. It commonly infects bats but is said to have ‘spilled over’ or transmitted to humans, probably through an intermediary host. This unprecedented pandemic has infected over 17 million people globally and resulted in over half a million deaths.

**Literature review:** With the advent of COVID-19, dental procedures requiring the use of a high-speed turbine with a water coolant are restricted because they generate aerosols. Contaminated by abundant microbes, saliva and secretions, these aerosols are potentially pathogenic, may scatter across long distances and remain suspended for a considerable period. The inanimate objects and surfaces may also remain contaminated for days, posing a serious health hazard.

Primary teeth have thinner, less mineralized enamel and dentin, and high pulp horns. Dental caries spreads rapidly in primary teeth, necessitating timely detection and intervention. In COVID-19 pandemic, non-aerosol generating dental procedures are advocated. The treatment of incipient caries using pit and fissure sealants and remineralization agents is recommended. For cavitated lesions, biofriendly options such as stepwise excavation or selective caries removal, arrest of carious lesions or sealing decay through coronal coverage are suggested, which are less traumatic, cost effective and more favourable for the pulp. The use of durable or lasting restorative materials is also highlighted.

**Conclusion:** In times of COVID-19 pandemic, and with no signs of an early let up, the presentation provides efficient and/or acceptable modalities for managing carious lesions in primary teeth.

**Adding a Splash of Colour!**

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**Background:** Fluoride is well documented as an anti-caries agent. With the advent of technology, it is now possible to successfully add fluoride to restorative materials. Aside from providing timely treatment to children, a pediatric dentist also needs to encourage the child in actively co-operating during appointments. One of the popular methods is to incorporate colours in a child's life. If a colourful environment of a dental clinic can brighten up a child's mood, then why stop there? With coloured composites, dentists are now one step closer in helping a child get more interested during boring dental appointments.

**Methods:** A total of 20 (n=10) samples were prepared with the help of aluminum blocks, Group A: Jen Rainbow coloured flowable composite, Group B: SDI wave Flowable composite. The samples underwent the process of thermocycling and the fluoride release of both the groups was checked at 24 hours, 48 hours and after 7 days. Data was analysed by Repeated Measure ANOVA test, Independent t test+ test.

**Results:** The fluoride release of Coloured composites (CC) is  $1.073 \pm 0.02$  after 24 hours,  $0.837 \pm 0.04$  after 48 hours and  $0.538 \pm 0.08$  after 7 days. On the 7th day, the fluoride content of CC is greater than that of SDI wave.

**Conclusions:** The coloured composite has almost a similar fluoride release to that of SDI wave. Hence this proves that coloured composites can be more useful in pediatric patients.

## The Use of Stainless Steel Crown in the Context of Minimal Interventional Dentistry for Treating Hypomineralized Molars

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**Introduction:** It is known that Molar-incisor hypomineralization (MIH) is a dynamic condition with an uncertain prognosis because the opacities can turn to enamel loss over time. There is a proposal for total removal of hypomineralized enamel, but this procedure is invasive and contrary to the philosophy of minimal interventional dentistry. One treatment option for these teeth is the stainless steel crown (SSC).

**Cases reports:** A 6-years-old boy was admitted to the pediatric dentistry clinic due to dental caries. The lesions where treated, however caries was not controlled, and the patient did not return to follow ups. The patient returned after 1 year, with a complaint of pain and tooth 26 had erupted with yellow-brownish demarcated opacities with loss of structure associated with caries lesion. The second case is a 7-years-old girl with complaint of hypersensitivity in the lower first permanent molar when eating hot/cold meals and toothbrushing. Clinical examination revealed opacities on occlusal and buccal surfaces with minor enamel loss. The tooth was already restored but the pain was not solved. The stainless-steel crown was used in both cases without any tooth preparation.

**Discussion:** On the first case, the choice of using SSC was due to the high risk of caries and the difficulty in adhering to follow-up appointments (restoration fails more frequently). In the second case the SSC was used to seal the opacities by covering them to solve pain sensitivity.

**Conclusion:** SSC when applied without tooth preparation is a good alternative for the treatment of MIH affected molars.

### **Estimation of Salivary Matrix Metalloproteinase-2 with Progressive Dentinal Caries and Evaluation of Levels Pre and Post Type 9 Glass Ionomer Cement Restorations- An In vivo Study**

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**Background:** To detect and quantitatively estimate the presence of salivary matrix metalloproteinase-2 in caries-free and caries affected children (6-9years) of Indian population and also to correlate quantitatively the presence of the same marker in caries affected children post follow-up of 1 month to GIC type-9 restorations.

**Methods:** Stimulated saliva samples were collected from two groups. Group I included 30 caries-free subjects with dmft/DMFT=0. Group II included 30 subjects with dmft/DMFT  $\geq 3$  (samples were collected pre in Group IIA and post-restoration with Type 9 GIC in Group IIB). Salivary MMP-2 were analyzed with a commercial ELISA kit (CUSABIO).

Statistical analysis : The levels of salivary matrix metalloproteinase-2 among the groups were compared by Unpaired t test & Paired t test respectively.

**Results:** Quantitative estimation of MMP 2 in Group II A (dmft/DMFT  $\geq 3$ ) caries affected subjects had significantly increased levels with a mean of  $30.49 \pm 7.16$  as compared to Group I (dmft/DMFT = 0) caries-free individuals with a mean of  $19.26 \pm 7.38$ . After GIC Type 9 restorations to Group II A, over a period of 1 month the quantitative levels markedly reduced to  $26.13 \pm 9.70$  for Group II B.

**Conclusions:** There is an increased level of expression of MMP-2 with multiple carious lesions. Subjects after follow up of one month to type 9 GIC restorations had a reduced score respectively suggesting an inhibitory effect.

**Management of White Spots Lesions With Resin Infiltration Technique: A Case Report**Gül Keskin, Zübeyde Uçar Gündoğar, Merve Yaman*Pediatric Dentistry, Faculty of Dentistry, Gaziantep University, Gaziantep, Gaziantep, Turkey*

**Introduction:** The resin infiltration technique, that is based on the principle of rapid penetration of low-viscosity light-curing resin into the micro porosities in the lesion body, is a non-invasive alternative for the treatment of white spot lesions. The purpose of the report is to present management and aesthetic rehabilitation of the white spot lesions using the resin infiltration technique.

**Case report:** A 12-year-old female patient was referred to the Department of Pediatric Dentistry at the Faculty of Dentistry at the Gaziantep University with a complaint of the non-aesthetic appearance of the maxillary anterior teeth. In clinical examination, demineralized lesions localized in the cervical areas of the maxillary incisors were revealed. Considering the patient's age, oral hygiene status, and limited lesions to enamel level, it was decided to perform the treatment using the Icon resin infiltrate (Icon®, DMG, Hamburg, Germany). The improvement of the aesthetic results were recorded in staining the white spot areas after resin infiltrate application. The patient is under follow-up protocol to evaluate the continuity of the treatment success.

**Discussion:** The resin infiltration technique improves the aesthetic appearance and prevents the progression of initial carious lesions. However, long-term follow-up data are not sufficient. Technique sensitivity of the procedure and caries risk of the patient affect the outcome of this micro-invasive technique.

**Conclusion:** This case report showed that the resin infiltration technique can be considered as an alternative for the treatment of white spot lesions.

## Restorative Dentistry

**"Wire Assisted Strip Crown (WASC) Bridge as a Fixed Alternative to Replace Missing Primary Anterior-  
Report of Two Cases"**

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**Introduction:** Premature loss of single primary anterior tooth is often left untreated with the justification to the parents that the permanent successor will eventually erupt in the oral cavity without considering its long-term sequelae. Different therapeutic modalities like removable partial dentures or space maintainers, to a Hollywood appliance can be used for the replacement of a prematurely lost single maxillary primary anterior tooth. Dentistry has advanced to a point where it is undesirable for children to be partially edentulous or to have unattractive anterior teeth.

**Case report:** Presented here is a novel approach to replace a single maxillary primary anterior tooth by means of the WASC (Wire Assisted Strip Crown) bridge, along with a case report.

**Discussion:** The sequelae resulting from premature loss of primary incisors can affect esthetics, quality of life, eating, speech development, arch integrity, development and eruption of the permanent successors, and development of oral habits. Additionally, the child often undergoes psychological as well as social trauma which is neglected by the society. If the primary teeth are lost at an early age, the eruption of their permanent successor is frequently delayed, resulting in a midline shift and subsequently malocclusion.

**Conclusion:** WASC bridge is a cost-effective technique to restore the form and function of missing primary anterior teeth with less chairside time. This novel technique is simple, more esthetic, and more comfortable than removable appliances. It can be considered as a long-lasting provisional treatment.



### Use of the Hall Technique for Management of Caries Relapse after General Anaesthesia

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**Introduction:** In very young and uncooperative children, comprehensive care is often provided under general anaesthesia. After treatment these affected children have a higher risk for future caries, the relapse rate varies from 24% to 53% at 2 years after general anaesthesia. The chairside management of recurrent caries can be facilitated by using the Hall Technique.

**Case Report:** A 5-year-old boy with a non-contributory medical history presented caries recurrence on the lower second primary molars one year after comprehensive dental treatment under general anaesthesia. The child's behaviour was assessed 4 on the Venham Scale, making treatment impossible without sedation. The Hall Technique was proposed to the child and his parents. Following exclusion of irreversible pulp damage and necrosis, the tooth was cleaned using a brush. After assessing tooth shape, contact areas and occlusion, a preformed metal crown was selected and sealed with glass ionomer cement, without local anaesthesia, caries removal or tooth preparation. At the 3-month and 6-month visits, the tooth exhibited normal physiologic mobility and was not tender to percussion. Radiographs revealed absence of any furcal radiolucency and reversal of internal resorption.

**Discussion:** The Hall Technique was developed for general practitioners in order to reduce untreated dental decay in primary teeth. Specialists in paediatric dentistry also sometimes use the Hall Technique before and during general anaesthesia.

**Conclusion:** Here we reported on use of the Hall Technique without sedation for treatment of recurrent caries following general anaesthesia for an uncooperative child.

### Clinical Performance of Class II Restorations with Bulk Fill Composite Resin after Selective and Total Removal of Dental Caries in Primary Molars: Randomized Clinical Trial

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**Background:** Bulk-fill composite resins seem to be an option for restoring deciduous teeth as they simplify the restorative protocol. The objective of this study was to evaluate the clinical performance of Class II restorations in primary molars after selective and total removal of carious tissue.

**Methods:** A split-mouth randomized clinical trial was performed with 82 children aged 7 to 12 years, who presented two caries lesions in dentin (Class II). Each child received two restorations and the teeth were allocated by raffle. In group one (n=82) the total removal of carious tissue was performed with rotary instruments. In group two (n=82), only manual excavators were used for the selective removal of carious tissue. The restorations were performed using Filtek Bulk Fill composite resin (3M) with Single Bond self-etching adhesive (3M). Clinical evaluation was performed by a blinded evaluator using the USPHS criteria, after 6 and 12 months. The statistical analysis included descriptive statistics, Chi-Square test and Kaplan-Meier.

**Results:** There was a statistical association between the groups regarding the color criteria at 6 (p=0.001) and 12 (p=0.003) months and marginal discoloration (p=0.026) at 12 months. Analysis of the Kaplan-Meier survival curve did not reveal a statistical difference (Log-rank; p=0.225) between the groups.

**Conclusions:** There was a difference in the clinical performance regarding color and marginal discoloration of bulk fill composite resin restorations performed in primary molars after total or selective removal of carious tissue, however, there was no difference in the survival rate of restorations.

Dental Materials, Infant Oral Health, Restorative Dentistry

## **Indirect Restoration and Conservative Approach for Molars with Molar-Incisor Hypomineralization: A Case Report**

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**Introduction:** Molar-Incisor Hypomineralization (MIH) is an enamel qualitative defect of systemic origin affecting first permanent molars and in some cases, permanent incisors. Due to the fragility, enamel can be fractured when subjected to mechanical forces. In these cases, the rehabilitation is a challenge.

**Case Report:** An 8-year-old female patient presented at the pediatric dental clinic due to caries lesions. Intraoral examination revealed the presence of MIH on all molars, with different degrees of severity. The treatment included different approaches according to the severity: minor enamel loss and caries lesions were restored with resin composite and teeth with high enamel loss were restored with conventional glass ionomer cement (GIC) using a simplified occlusal replica adapted technique. After obtaining maxillary and mandibular impressions, in the laboratory phase, a wax-up of the missing structure was performed. Then an addition silicone matrix of the wax-up was taken. In the clinical phase after acid conditioning, the matrix was filled with GIC, positioned on each tooth, and pressed for the GIC setting time.

**Discussion:** There is no evidence of the best strategy for MIH affected molars rehabilitation. The proposed technique with no tooth preparation and use of GIC is specially indicated for patients with newly erupted MIH severely affected molars, diminishing the risk of pulp exposure.

**Conclusion:** The present report showed that treatment planning might consider the characteristic of each tooth. In addition, the proposed technique may be an advantageous option for MIH affected molars, since it is able to accurately reproduce the occlusal anatomy through an agile and comfortable procedure.

**Aesthetic Changes in Young Permanent Dentition: A Minimally Invasive Treatment Alternative**

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**Introduction:** The growing demand for minimally invasive interventions has led to the emergence of a new technique using low viscosity infiltrating agents (resins) capable of deep penetration. Currently, this technique constitutes a therapeutic possibility for incipient non-cavitated lesions and/or some superficial chromatic changes, aiming to avoid the conventional cavity preparation, which inevitably compromise tooth structure.

**Case report:** The two presented case reports describe the treatment of enamel defects in young permanent incisors of two 10-year-old children, with enamel opaque stains and evident aesthetic impairment, using Icon® infiltrating resin (DMG, Germany). After rubber dam was placed to protect soft tissues, conditioning with Icon Etch was performed, followed by drying with Icon Dry and subsequent application of Icon Infiltrant, according to the manufacturer's instructions.

**Discussion:** This technique demonstrated having several advantages, as already described in literature, mainly related to the arrest of caries progression and aesthetic improvement in different clinical conditions.

**Conclusion:** The immediate results proved to be satisfactory in both children, with the patients having been monitored for approximately 1 year

### **Effectiveness of Preoperative Analgesia in Restorative Treatment of Children with Molar Incisor Hypomineralization: A Pilot Study**

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**Background:** The current literature does not present a preoperative pharmacological protocol or strategies for the control of transoperative pain in patients with molar incisor hypomineralization (MIH). The aim of this study was to verify the efficacy of preoperative analgesia with betamethasone in reducing self-reported pain during restorative treatment of permanent molars with MIH compared with a placebo control group.

**Methods:** A randomized, doubleblind, placebo-controlled pilot study was conducted. Thirteen children aged 7 to 12 years who required restorative treatment in permanent molars diagnosed with MIH were randomly selected and divided into two groups, according to the preoperative analgesia solution: betamethasone and placebo. Self-reported pain was assessed with a Numerical Rating Scale, at four distinct moments (T1: intensity of tactile pain before medication/ T2: intensity of tactile pain after medication and prior to anesthesia; T3: intensity of tactile pain after anesthesia/ T4: intensity of pain during cavity preparation). Children`s anxiety was assessed with the Facial Image Scale, and initial air jet sensitivity was also evaluated using the Schiff Sensitivity Scale. Data analysis included descriptive statistics, repeated measures analysis and multiple linear regression ( $p \leq 0.05$ ).

**Results:** The study found no statistically significant association between previous betamethasone administration and transoperative self-reported pain reduction compared to placebo.

**Conclusion:** Prior administration of betamethasone did not significantly reduce self-reported transoperative pain in the restorative procedure children with MIH.

### Comprehensive Rehabilitation in a Patient with MIH

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**Introduction:** Molar-incisor hypomineralization (MIH) is defined as a developmental enamel defect that affects at least one permanent first molar. Affected anterior teeth might also be observed. MIH is characterized by demarcated opacities that vary from white to a brownish color and which may progress to a posteruptive enamel breakdown. In the most severely affected individuals, dentin will be exposed.

**Case report:** 9.5-year-old male patient attended the Pediatric Dentistry service. Reason for consultation: "Dental Caries" Apparently healthy base diagnosis. Intraoral inspection shows MIH to different degrees in permanent first molars. Radiographically, a radiolucent area was observed near the DO cameral pulp. 26, 46, in OD. 36 radiolucent zone communicating in cameral pulp.

**Discussion:** Indirect pulp coatings were made with a bioactive dentin substitute material (Biodentine) in OD. 26, 46, and in OD. 36 a pulpotomy was performed with the same bioactive material mentioned above. In subsequent appointments, nickel chrome crowns were placed on the treated molars. Favorable results were observed at a 3-month follow-up appointment.

**Conclusions:** Restorations in patients with HIM are complex treatments with reserved prognoses, which require exhaustive follow-up, as well as long-term patient cooperation and commitment.

## **Influence of Casein Phosphopeptide - Amorphous Calcium Phosphate Nanocomplexes (CPP-ACP) on Marginal Integrity of Conventional Glass Ionomer Cements (GIC) in Cervical Restorations**

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**Background:** The objective of this in-vitro study was to evaluate and compare the microleakage property of Type IX GIC, Type VII GIC and Type VII GIC with CPP-ACP

**Methods:** Standard Class V cavities were prepared on the facial surface of 60 caries free premolars. Samples were randomly divided into three groups consisting of 20 samples each and were restored with FUJI Type IX Capsules, FUJI Type VII White Capsules and FUJI Type VII White EP Capsules following manufacturer's recommendations. Samples were thermocycled, immersed in 2% methylene blue dye, sectioned buccolingually and the section showing the maximum degree of dye penetration was graded following Khera and Chan criteria under Stereo microscope.

**Results:** On statistical analysis (ANOVA), the three groups showed statistically significant differences with respect to dye penetration score at 5% level of significance. Intergroup comparison between Type IX and Type VII GIC as well as, Type IX and Type VII GIC with CPP-ACP using Paired Student's t-Test showed statistically significant difference with lowest microleakage in Type IX GIC. No statistically significant difference in microleakage property was found between Type VII GIC and Type VII GIC with CPP-ACP.

**Conclusions:** Although no material completely eliminated microleakage, Type IX GIC due to its superior composition demonstrated better microleakage property followed by both Type VII GICs. CPP-ACP was found to have no influence on the microleakage property of Type VII GIC and also, this study doesn't recommend Type VII GIC for invasive cervical restorations rather than caries stabilization.

**Crown Fracture of an Unerupted Incisor in a 7-year old Child: Case Report and Restorative Considerations**

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**Introduction:** Crown fractures are a concern in pediatric dentistry considering the negative impact on oral health-related quality of life of children and adolescents. The advance of adhesive dentistry associated with dental digital techniques enables the improvement of minimally invasive approaches providing outstanding aesthetic results.

**Case report:** This case report describes a restorative crown-fracture protocol of an unerupted permanent upper incisor in childhood. The treatment strategy involved clinical and radiographic monitoring emphasized on the observation of the eruptive process and root formation of the upper central incisors. The rehabilitation process was obtained by a minimally invasive approach based on the twin sister identical dental anatomy scanning by CAD/CAM system and resin stratification technique using a silicone index guide. The treatment option was effective from the perspective of continued root development, pulp vitality maintaining and favorable functional and aesthetic results.

**Discussion:** Traumatic dental injuries are the fifth most prevalent disease/injury in the world. Although rare, crown fracture of an unerupted incisor may occur in childhood, demanding a considerable clinical and radiographic follow-up. In addition, techniques that can be completed in a timely and efficient manner are important in pediatric dentistry. Predictable and positive long-term aesthetic outcomes can be achieved using a CAD/CAM system associated with adhesive restorative protocols.

**Conclusion:** Evidence-based dental practice is toward a more conservative approach that preserves natural tooth structure while keeping the procedure fast and tolerable for the pediatric dental patients. Nowadays, digital techniques become increasingly integrated into restorative procedures.



## A Clinical Evaluation of Conservative approach and GIC Performance in MIH-Affected Molars: Three-year Results

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**Background:** There is no consensus on the exact treatment protocol in molar incisor hypomineralization (MIH) affected cases. The restorative management of molars with MIH represents a challenge in the clinical practice with high failure rate. Currently, minimal intervention dentistry concepts based on including minimally invasive cavity preparations. The new approach, more controversial due to a paradigm shift, is selective removal of the affected area. The aim of this study was to evaluate the clinical performance of GIC in first permanent molars that are affected by MIH.

**Methods:** This study included 31 children, 8 to 12 years of age, diagnosed with MIH at the Pediatric Dentistry Clinic of the Dental School in Marmara University. The 65 FPMs affected by MIH with structural loss and caries lesion, or non-satisfactory atypical restorations, were restored with Bulk fill glass hybrid restorative system (Equia Forte, GC JAPAN) and evaluated by Modified- USPHS at baseline and at 3 years.

**Results:** Of the 65 molars included in this study, 52 restorations were observed after 3 years; 13 restorations at 3-year evaluations were not available due to non-attendance of patients. The likelihood of a restored tooth remaining unchanged at the end of 3 years was 38 (73.07%). The cumulative failure rate after 3 years in the present study was estimated to be 14 (26.9%). 12 secondary caries were examined after 3 years. Failures were due to either retention or to loss of marginal ridge integrity.

**Conclusions:** It can be concluded that the first permanent molars affected by MIH restored with minimal invasive cavity preparations using Bulk fill glass hybrid restorative system was found clinically successful during a 3-year period.

Dental Anomalies, Dental Materials, Restorative Dentistry

### **The Aesthetic Restoration of Missing Anterior Teeth and Maxillary Polydiastema with Composite Mock-Up Technique and Fiber Bridge**

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**Introduction:** Mock-up technique and fiber bridge are frequently used techniques in the last years in order to fulfill patients' aesthetic needs. Mock-up technique is a bio aesthetic approach for the excessive material loss in the teeth, missing of the teeth, and congenital aesthetic defects and it is used for both diagnosis and aesthetic treatment. Fiber bridges are successfully applied especially for the missing single tooth. In that case report, it is aimed to present the aesthetic treatment using mock-up technique and fiber bridge in a child patient having missing anterior teeth and maxillary polydiastema not treated by orthodontic treatment before.

**Case report:** The oral examination of a 14 year-old male patient consulted at Atatürk University Faculty of Dentistry Department of Pediatric Dentistry for aesthetic reasons was performed. The orthodontic treatment of the patient who has polydiastema and missing single tooth had been completed before. A model was produced after getting measurements from the patient. The silicon key produced from the model was used as a guide and the diastemas were closed by composite resin. After that, the fiber bridge was positioned for the missing tooth.

**Discussion:** Diastemas and tooth deficiencies in the anterior region can lead to aesthetic problems. Direct composite restorations and fiber bridges have long been used in the treatment of aesthetic problems, giving aesthetic and clinically acceptable results.

**Conclusion:** Direct composite restorations and fiber bridges can be preferred in patients with diastema and tooth deficiency due to their easy application and ability to meet aesthetic and economic requirements.

### **Case Report of a Young Patient with Dental Trauma in the Higher Central Incisives and 12 years of Monitoring**

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**Introduction:** The restoration of a harmonic smile after dental trauma is a challenge for restorative dentistry. The aim of this study is to report a clinical case in which a young patient had traumatized upper central incisors and was followed up for 12 years.

**Case report:** A 9-year-old male patient attended the Odontopediatrics clinic of “Academia cearense de Odontologia” for emergency care, after trauma and endodontic treatment in elements 11 and 21. Because it was an extensive fracture, treatment with fixed prostheses was indicated, but after clinical and radiographic evaluation, it was decided to perform restorative treatment with composite resin. Only at the age of 19, the patient sought the clinic again and presented a complaint of diastema between the traumatized teeth and a change in the color of these elements, leaving the composite resin more evident. Dental bleaching was performed in the office, followed by the exchange of composite resins. At the age of 21, in the clinical follow-up, dental whitening treatment was performed and the resins remained intact.

**Discussion:** Dental trauma occurs commonly in the general population, which is why it is present in dental offices. The aesthetic rehabilitation treatment can be carried out with composite resins or fixed prostheses, a correct diagnosis of which technique and which materials are most suitable for each clinical situation is essential in this choice.

**Conclusion:** The reported case was solved by performing the aesthetic techniques with photopolymerizable composite resins. These restorations are minimally invasive procedures, which provide good aesthetics and restore function.

### Spectrum of alternatives for Scintillating Smiles

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**Background:** Dental caries due to exponential exposure to cariogenic food substances, limited abilities to effectively adapt self-oral hygiene practices in children and lack of awareness among parents, have all influenced the oral health status in children negatively. Besides being smaller tooth structure, the normally-found deep bite with very little clearance area also poses a difficult task when restoring deciduous dentition. Carious involvement of teeth not only potentially compromises the integrity of the dentition but can also create an undesirable esthetic appearance.

The choice of restoration for primary teeth must provide an aesthetic appearance in addition to restoring function and durability. Therefore, crowns are considered as a viable alternative in prevention of restorative failure when compared to direct restorations especially in terms of longevity.

#### Literature review:

1. An article by Venika Garg et al, 2016 in review of Crowns in Paediatric dentistry has explained that the full coverage restorations are important to restore the badly broken teeth in primary dentition.
2. An article by Joshua Ng Chor Yang et al, has evaluated titled different crowns for primary anterior teeth which have advanced to aid many types of crowns that have been developed and advanced to aid the clinician in rehabilitating deciduous anterior teeth.

**Conclusion:** With the advancement of adhesive dentistry and new materials, the treatment approaches in the form of varied crowns like Stainless steel crowns, Nusmile, Zirconia, Fiberglass, Figaro and Edelweiss crowns are available today to ensure retention and durability, thus restoring the functional and esthetic rehabilitation of a child.

### **Modification of Smile`S Perception after Aesthetic and Functional Rehabilitation in a Patient with Severe Childhood Caries**

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**Introduction:** Early Childhood Caries (ECC) is a multifactorial disease that affects children in the preschool phase, and its most aggressive form is called Severe Childhood Caries (SCC). The present study aimed to describe the clinical case of aesthetic and functional rehabilitation of a 4-year-old male patient affected by SCC.

**Case report:** A resin rehabilitation was performed on the upper anterior teeth using the “Styleitalian technique”. This is an excellent technique for pediatric dentists who wish to produce simplified and excellent aesthetic dentistry. This is accomplished by using specific Styleitaliano spatulas, mainly the Misura spatula that measures 0.5 mm for the last enamel layer. Basically, the technique uses 2 different opacity resins from Filtek™ Z350 XT. The sequence of the technique starts by placing enamel resin on the palatal side and then the dentin shade, using the Misura spatula. The 0.5 mm gap was measured and finished with enamel resin. In the posterior teeth, restorations with resin were performed using the direct technique as well. Guidance on the importance of good eating and hygiene habits was enforced.

**Discussion:** The proposed treatment restored the chewing function and aesthetics of the smile. The child and his family were very satisfied with the result.

**Conclusion:** The rehabilitation treatment with direct restorative techniques and resins in children affected by ECC disease, is efficacious in obtaining a satisfactory aesthetic result and to promote oral health and general well-being for the patient and his family.

**Case Report of a Young Patient with Idiopathic Gingival Fibromatosis and 10-year Follow-up**

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**Introduction:** Idiopathic generalized gingival fibrosis is a challenge for pediatric dentists. The aim of this study is to report a clinical case in a young patient with idiopathic gingival fibrosis and follow-up for 10 years.

**Case report:** A male patient, 9 years old, attended the odonto-pediatrics clinic of the “Academia Cearense de Odontologia” for periodontal surgery. This was after several frustrating attempts at dental care with surgeons, for having a high degree of anxiety and fear as during his early childhood he had several ICU admissions for suspected rheumatological problems and hypertension. His emotional state was also affected by not having teeth in his mouth, but gums with a high degree of fibrosis. As soon as we performed the first gingivectomies, the patient’s self-esteem was obvious!. Due to the many medications the patient was taking and the arrangement of the teeth in the arches, it was necessary to do some surgical touch-ups over the 10-year follow-up. The trust and empathy with the pediatric dentistry professionals made him prefer to continue in the specialization clinic in pediatric dentistry.

**Discussion:** Idiopathic generalized gingival fibrosis is not common in pediatric dentistry. However, the general view of the pediatric dentist with differentiated conditioning techniques, makes surgical treatments more pleasant and safe.

**Conclusion:** The reported case was solved with conventional gingivectomy surgical techniques with electric and manual scalpels. Providing pleasing aesthetic, functional, and emotional results.

### Comparing the Effect Of 38% Silver Diamine Fluoride on Shear Bond Strength of Two Different Luting Cements to Caries Affected Dentin in Primary Posterior Teeth

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**Background:** The advancement in concepts surrounding the caries process gives the pediatric dentists the capability to practice minimally invasive dentistry. SDF and Hall crowns have been the game-changers, that may be employed together or separately in caries management. The purpose of this study is to compare SDF's effect on shear bond strength (SBS) of Glass Ionomer Luting Cement (GIC) and Resin Modified Glass Ionomer Luting Cement (RMGIC) on carious dentin of primary posterior teeth.

**Methods:** Forty extracted primary posterior carious teeth were randomly assigned into four groups of ten each. Group 1: Caries with GIC. Group 2: Caries with RMGIC. Group 3: SDF with GIC. Group 4: SDF with RMGIC. 2mm buttons of GIC (Ketac) and RMGIC (Rely-X) were bonded onto dentin substrate. Instron 5566A was used to test SBS with 1K load cell and crosshead speed of 1mm/minute. Descriptive analysis and Two-way ANOVA with Tukey's HSD for post-hoc analysis was done.

**Results:** In decreasing order, mean  $\pm$  standard deviation of SBS values: Caries with RMGIC:  $1.34 \pm 0.32$  MPa. SDF with GIC:  $1.15 \pm 0.42$  MPa. Caries with GIC:  $0.88 \pm 0.25$  MPa. SDF with RMGIC:  $0.81 \pm 0.39$  MPa. There was a significant difference between SBS of RMGIC and GIC in the absence of SDF ( $P = .0324$ ). There was a significant difference in RMGIC's SBS on SDF treated dentin versus untreated carious dentin ( $P = .0101$ ).

**Conclusion:** On primary posterior teeth, pre-treatment of carious dentin with SDF negatively impacts bond strength of RMGI luting cements, but positively impacts bond strength of GI luting cements.

**Aesthetic Rehabilitation of a Patient with Multiple Dental Agenesis and Interdisciplinary Treatment**

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**Introduction:** Aesthetic dental treatment can involve a conservative and interdisciplinary approach, with planning and execution of ideal treatment. The aim of this study is to present a clinical case report involving multiple dental agenesis and interdisciplinary treatment, with orthodontics, dental implants, gingival repair, and tooth whitening.

**Case report:** AFF, a female, 15 years old, attended the odonto-pediatrics clinic of “Academia Cearense de Odontologia” reporting dissatisfaction with her smile. After initial clinical and radiographic examination, multiple agenesis of teeth 12, 22, 25, 26, 26, 35, 44 and 45 was found. The patient was referred for orthodontic treatment to position the upper canines on the lateral side. With the end of bone growth and orthodontic treatment, it was possible to install the implants in the sites of agenesis. Gingival surgery of the upper canines was performed to harmonize the smile. The tooth whitening treatment was the last step before the definitive installation of the prostheses on implants.

**Discussion:** The performance of rehabilitation due to aesthetics has become a common clinical practice, which in many cases involve different specialties, which must act in a planned and integrated way to obtain satisfactory and predictable results.

**Conclusion:** Oral aesthetics are transformative, promoting improvement in self-esteem, meeting functional needs such as chewing, phonation and swallowing, thus providing well-being to the individual.



## A Minimally Invasive Technique for the Restorative Management of a Severe Case of Molar Incisor Hypomineralization (MIH): A 6-years Follow Up

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**Introduction:** Molar Incisor Hypomineralization (MIH) is a specific form of qualitative enamel defect affecting one or more first permanent molars (FPMs) and / or incisors. The increased organic content makes the enamel susceptible to rapid post-eruptive breakdown (PEB) under the influence of daily masticatory forces. This atypical nature of enamel destruction and frequent loss of restorations owing to reduced bond strength, significantly contribute to make the management of severe cases a challenge for the pediatric dentist.

**Case report:** Francesca, a 7-year old girl, with no significant medical history, reported with pain on all FPMs. Severe MIH with PEB and carious lesions (ICDAS 6) were diagnosed basing on the clinical appearance. No clinical or radiographical signs of endodontic involvement were found. A minimally invasive «index-driven» approach without any crown preparation was chosen. Due to the depth and the extension of the lesions, we decided to directly go for the restorative step without any previous topical remineralizing therapy based on Casein Phosphopeptide-Amorphous Calcium Phosphate (CPP-ACP). Two full arch alginate impressions were performed in order to obtain two casts, the wax-up of the four FPMs, and the corresponding occlusal semi-rigid (60 Shore A) transparent silicon indexes (Visio.sil - Bredent GmbH & Co.KG - Senden, Germany). During the appointments, after appropriate local anesthesia (4) and rubber-dam isolation, careful removal of the caries was carried out, keeping as much as possible sound tissue. To avoid any pulp response, a resin modified glass-ionomer cement liner was used. (Ionoseal - VOCO America Inc., Riarcliff Manor - USA). Subsequently, a two-step mild self-etching adhesive (Clearfil SE Bond – Kuraray - Osaka, Japan) with previous selective enamel etching was used. A resin composite stratification with a flowable composite (Clearfil Majesty ES Flow – Kuraray - Osaka, Japan) and a packable nanohybrid composite was performed (Clearfil Majesty Es-2 – Kuraray - Osaka, Japan). To obtain good control of occlusal contacts, the last layer was light cured for 60 s only after the positioning of the transparent silicon index. After the silicon indexes were removed, a 20 s extra light-cure with a glycerin layer was performed. No occlusal adjustments were required, the finishing and polishing steps were performed using a manual finishing “scaler” (Eccesso – LM Dental – Finland), and a finishing bur kit (Finishing Style Set – Brasseler – Germany).

**Discussion:** After six years, during which a strict follow up and a personalized oral hygiene program were done, no clinical or radiographic signs of restorative or endodontic failure were found. The advantages of this technique are the huge respect of dental tissue and the speed of treatment in respect of direct restoration (in terms of chair time) and in respect of indirect restoration (in term of numbers of visits). The disadvantage is the need to carefully check the restorative margins during the follow up.

**Conclusion:** In severe cases of MIH, a direct composite restoration could be considered a therapeutic option as much predictable as other more invasive approaches. Thanks to the limited cost and chair-side time, the use of an «index-aided» technique, could help the clinician improving the technical and behavioral management of severe MIH with post-eruptive breakdown. Starting from this case report, to support clinicians toward a minimally invasive approach, high quality-well design studies could be elaborated on.

**Aesthetic Rehabilitation of Maxillary Central Incisors Affected by Molar-Incisor Hypomineralization.**

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**Introduction:** The Molar-Incisor hypomineralization (MIH) is a qualitative defect of the dental structure, of systemic origin that affects mainly the first molars and is commonly associated with permanent incisors. Clinically, the defects have different degrees of severity and opacity, ranging from white-yellow or yellow-brown, usually followed by fragile enamel, high susceptibility to caries, and tooth hypersensitivity. This case report describes a restoration protocol using direct composite resin to improve the function and aesthetic of the smile.

**Case Report:** An 8-year-old female patient attended the university dental clinic complaining about the aesthetics of the restorations of the maxillary incisors, dentin hypersensitivity, and low self-esteem. During history taking it was reported that the patient had meningococemia when she was less than two years old, and that the teeth were already "born sensitive", and was already diagnosed with MIH and restored. In the intraoral clinical examination, it was observed that the teeth 11/21 presented restorations with alteration in shape, color, fractures, while the molars presented with slight changes in opacity, without structural loss. Considering the age of the patient, and aesthetic necessity was planned and direct restorations in composite resin was performed.

**Discussion:** Planning is an essential step in the clinical design. Special attention was given to the patient's age in the search for a harmonic, functional, and aesthetic result for a child's wishes and applying the concepts of minimally invasive dentistry.

**Conclusion:** The treatment performed restored the patient's function and aesthetics, returning her self-esteem. In addition, the patient reported improvement in dentin hypersensitivity and life quality.

Education in Paediatric Dentistry, Endodontics, Periodontal Disease in Children, Restorative Dentistry

### **Oral Rehabilitation in a Pediatric Patient with Malnutrition: A Case Report**

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**Introduction:** Malnutrition refers to an imbalance between the nutrient supply and the body's demand to guarantee tissue growth. This alteration results in generalized tissue hypotrophy due to lack of nutrients, which leads to oral cavity repercussions, such as a decreased buffer capacity of saliva that triggers dental caries.

**Case report:** A four-year-old male patient, whose diagnosis is Early Childhood Caries, presented with abscesses and generalized gingivitis. After obtaining an adequate medical history and signed informed consent from his parents, a comprehensive rehabilitation, including pulpal and restorative treatments, was planned. Results of a 1-year follow-up will be presented.

**Discussion:** The aim of comprehensive oral rehabilitation in pediatric patients is to preserve the integrity of primary dentition in order to: avoid delays in the patient's growth and development, prevent malocclusion, reduce harmful habits, prevent psychological sequelae, and improve cognitive development, phonation and mastication.

**Conclusion:** Oral rehabilitation of pediatric patients with systemic compromise and Early Childhood Caries can restore their quality of life and improve their psychosocial well-being.

**Esthetic Management of Fused Primary Anterior Teeth: A Case Report**

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**Introduction:** Developmental anomalies of teeth are frequently encountered in the pediatric clinical dental practice and present with various challenges to the pediatric dentist. One such anomaly is `fusion` of anterior teeth. These anomalies can lead to high caries risk, unesthetic appearance, delayed or ectopic eruption of the permanent successor or malocclusion. Early identification, prompt treatment and esthetic rehabilitation of such anomalies is important for proper dento-skeletal form and psychological development of the child. The purpose of this case report is to present a case of fused primary maxillary central and lateral incisors and its effective management.

**Case report:** A 4-year-old male child patient reported with a chief complaint of pain and carious teeth in the maxillary anterior region of the jaw. Intra-oral and radiographic examinations indicated that the left primary central and lateral incisors were fused. An OPG was advised to identify similar anomaly in the permanent successors. The primary teeth were pulpectomised and restored using glass-ionomer cement. A small groove was made between the fused teeth to make them separate entities. The teeth were then restored esthetically using composite strip crowns. A 12 months follow-up revealed complete retention of the esthetic restoration.

**Discussion:** Esthetic management of fused anterior teeth helps with self-esteem of the young child. It also minimizes harmful habits like tongue thrusting and maintains the normal growth of the jaws. The permanent successors require timely evaluation and if needed, correction in future.

**Conclusion:** This report shows a successful management of fused primary teeth with esthetic rehabilitation.

Dental Materials, Restorative Dentistry

## **Comparative Evaluation of Mechanical Properties after Application of G-Coat Plus, Newly Formulated Nano Silver Fluoride(NSF) Resin Coat and Vaseline over Glass Ionomer Cement Restoration**

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**Background:** In contemporary dentistry, glass ionomer cement (GIC) has gained popularity in paediatric dentistry. For overcoming the trouble of moisture sensitivity, various coatings like petroleum jelly, varnishes or bonding resins are applied over GIC to avoid contamination. G-Coat Plus (GC) was recently launched to serve this purpose. Nevertheless, the problems of microleakage, low strength and fluoride release still persist. Hence, this present study was performed to evaluate effect of newly formulated resin protective coating on microhardness and microleakage of commercially available GIC, Fuji II, under in vitro conditions.

**Methods:** 150 orthodontically extracted, non-carious premolars were selected. A standardized Class V cavity was prepared on buccal surface of each tooth for assessment of microleakage, and microhardness. To assess both the parameters the samples were divided into 3 groups, Group1-Vaseline, Group2-G coat plus, Group3-NanoSilverFluoride resin coat. Protective surface coatings were applied and samples were placed in artificial saliva. Thermocycling was carried out at 5°C and 25°C for 300 cycles. Surface microhardness was tested by Vickers microhardness testing machine under a load of 50grams for 10seconds. For microleakage testing, samples were immersed in 1% methylene blue for 24 hours, sectioned and evaluated under stereomicroscope for dye penetration.

**Results:** There was a statistically significant difference in NanoSilverFluoride resin coat and G coat plus group in terms of both microhardness and microleakage. Vaseline group showed poor results in both the assessment.

**Conclusions:** Samples protected using NanoSilverFluoride resin coat demonstrated better mechanical properties than the other products as well as having better fluoride release and antibacterial properties.

**Aesthetic and Functional Rehabilitation in a Patient with Non-Carious Cervical Injuries**

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**Introduction:** Non-cariou lesions are characterized by the irreversible and gradual loss of mineralized tissue, without any bacterial involvement. The aim of this study was to report the minimally invasive treatment of a young patient with injuries from abrasion, erosion and attrition due to multifactorial influence.

**Case report:** Young male patient, had teeth with abrasion, erosion and attrition lesions. Erosion lesions on the occlusal surfaces of molars and mandibular premolars were classified according to the Basic Erosive Wear Examination (BEWE) index. Restorative treatment was performed under isolation, without drills, and restored with Filtek Universal resin. In addition to the restorative treatment, an MRI of the TMJ was taken for a new orthodontic evaluation.

**Discussion:** In order to guarantee the success of the treatment, clinical management for high-risk patients with erosive wear was performed according to the BEWE index, followed up every 6 months, checking the risk factors and the use of fluoride products.

**Conclusion:** It is possible to perform the minimally invasive rehabilitation treatment on teeth with non-cariou lesions successfully, but the choice of treatment should include careful clinical examination, in order to identify the etiological factor, preventing progression due to the destructive nature of these injuries.

## **The Smile Changer: A Case Series of Rehabilitation of Maxillary Primary Anterior Teeth using Zirconia Crowns**

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**Introduction:** Aesthetic management of grossly decayed primary maxillary anterior teeth as seen in severe early childhood caries (S-ECC) or dental trauma, especially in very young children, can pose a challenge to pediatric dentists due to factors like smaller tooth size, thin enamel, larger pulp chambers and lack of patient's cooperative ability. Zirconia crowns have provided an excellent treatment option for aesthetic and functional rehabilitation of primary anterior teeth in comparison to other treatment modalities that have been tried over the years.

**Case Report:** This case series presents two cases showing S-ECC affecting the maxillary primary anterior teeth which were restored using (NuSmile) zirconia crowns. Case 1: A 2.7 year old girl with grossly decayed maxillary incisors that were endodontically treated and restored with zirconia crowns under general anaesthesia and followed up clinically and radiographically for a period of 30 months. Case 2: A 4.2 year old boy with high aesthetic concerns where all the maxillary anterior teeth were managed with chair-side placement of zirconia crowns on vital teeth and followed up for a period of 12 months.

**Discussion:** Restoration of grossly decayed anterior teeth at an early age is a great confidence booster for the child as a result of its excellent aesthetic outcomes. The advantages of zirconia crowns exhibit natural aesthetics, tissue compatibility, durability, colour stability.

**Conclusion:** In both cases, the crowns have shown good retention, good soft tissue response and excellent aesthetic results. Zirconia crowns are a good alternative for aesthetic rehabilitation of severely decayed /fractured primary teeth.

### A Case Series of Aesthetic Rehabilitation for Primary Anterior Teeth

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**Introduction:** Aesthetics plays a significant role in modern day pediatric dentistry. A pediatric dentist faces a dual challenge of satisfying the aesthetic expectations of the patient and parents. In the present era, there are numerous restorative and rehabilitative techniques that can be applied to different clinical scenarios. However, we have to choose the technique that best suits our patient's aesthetic, functional, psychological and financial needs. The following paper presents different treatment modalities for aesthetic rehabilitation of primary anterior teeth.

**Case report:** The current case series depicts three cases with different aesthetic treatment modalities performed by a single operator on patients between three to four years of age. The first case involves restoration of primary anterior teeth with strip crown post endodontic therapy. In the second case primary central incisors were rehabilitated using zirconia crowns. In the third case severely, mutilated primary anterior teeth were extracted and replaced with a fixed functional space maintainer (Gropers appliance). All these cases have an average 1 year follow up.

**Discussion:** Depending on various clinical case presentations, the above three mentioned rehabilitation strategies like strip crown, zirconia crown and Gropers appliance can be used. However, strip crowns being economical compared to zirconia crowns are more technique-sensitive. Gropers appliance is one of the best available treatment modalities for missing primary anterior teeth.

**Conclusion:** All the three treatment modalities address the aesthetic, functional and psychological and financial needs of patients.



**Envisioning the Future of Restorative Materials**

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**Background:** Dental caries is a highly prevalent and costly disease in the world, representing the most common infectious disease in the paediatric population. Restoration of decayed primary teeth is important so as to maintain the health of the primary teeth for proper chewing and eating, providing space for the permanent teeth and guiding them into the correct position and permitting normal development of the jaw bones and muscles.

**Literature review:** Many direct filling materials are available in modern day dental practice. Amalgam was first introduced to western dentistry in the 19th century while the glass ionomer cements were introduced around the 1970s. Composite became standard restorative material in 1980s while resin modified glass ionomers and compomers came into practice in 1990s and the current decade saw the launch of several bulk-fill composites. Multicolored restorative material like Fuji VII and MagicFill are manufactured in various bright colors with glitter inclusions to attract the children. It is polymerized both by light cure and chemical resin cure with high physical strength. Recently, bioactive dental materials are introduced which stimulates the formation of apatite and chemically bonds to teeth sealing the cavity. ACTIVA bioactive is the only esthetic bioactive restorative material.

**Conclusions:** Thus, oral health professionals need to make wise decisions about the type of restorative material to be used to best manage the patients with childhood caries.

## Clinical Evaluation between Stainless Steel Crowns and Luxa Crowns in Primary Molar Teeth – An In Vivo Study

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**Background:** Early childhood caries is a complex disease involving maxillary primary incisors within a month after eruption and spread rapidly to involve other primary teeth. ECC is a multifactorial disease which continues to be dominant in children, especially in family with low socioeconomic class. ECC is construed as “the existence of one or more tooth decayed (non cavitated or cavitated lesion), removed (due to caries), or filled tooth surfaces in primary dentition of children under the age of 6 years”.

The aim of this study was to compare the luxa crown with stainless steel crown in primary molars, in vivo in terms of gingival bleeding, plaque accumulation and retention.

**Methods:** A total of 60 primary teeth in healthy, cooperative children aged 4 to 8 years (either male or female) have at-least 1 or 2 primary teeth indicated for crowns. The evaluation of each crown restoration was assessed from same day of procedure to 3 and 6 months. The clinical parameters were evaluated with visual assessment of the restoration. The gingival health, plaque accumulation around the crown was assigned using blunt periodontal probe using the Gingival index, the Plaque index and retention index systems.

**Results:** The result for good retention was better for stainless steel crown as compared to luxa crown. In case of Plaque index the mean value greater for luxa crowns as compare to stainless steel crowns (p-0.05) The Gingival index the score were greater for luxa as compare to stainless steel crowns (p - 0.05).

**Conclusion:** Stainless steel crowns were the best material for full coverage as measured by Gingival index, Plaque index and retention.

# *Sedation*

## Sedation

**Dental Treatment of Non-Cooperative Patients Using Oral Midazolam Sedation at a Brazilian Institute of Reference**

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**Background:** Non-cooperative, physically handicapped individuals generally present diverse oral alterations. The use of preoperative sedation is a possibility, since consciousness, response to verbal commands, and the laryngeal protection reflex are preserved. Our objective is to evaluate the effectiveness of the use of sedation with oral midazolam to control stress during the dental treatment in these individuals at a reference institution.

**Methods:** Participants received a dose of .5mg/kg of midazolam on an empty stomach sixty minutes before the dental treatment. The behavioral evaluation took place before and after administering the medication using the Venham (VE) scale and based on: Relaxed, Apprehensive, Tense, Reluctant, Interruption due to protests, or No communication. The anesthetist monitored the heartbeats per minute in intervals of 10 minutes during the treatment.

**Results:** Of the 124 individuals who participated in the study, 58 (46.4%) were female, 66 (52.8%) were male, with ages between 1 and 17 years ( $8.5 \pm 4.2$ ). 130 (82.4%) individuals had cerebral palsy, 8 (6.4%) had myelomeningocele, 6 (4.8%) were syndromic, and 8 (6.4%) had other deficiencies. Were homogeneous for sex ( $p=0.408$ ). Of the 125 (100%), only 8 (6.4%) showed behavior with no communication. The average bpm after sedation varied according to age between 89 and 114 (ages 1 to 3), 80-140 (ages 4 to 12), and 76 - 84 (ages 13 to 17).

**Conclusion:** The practice of sedation using midazolam showed a significant reduction in stress for the majority of patients. No respiratory depression or decrease in heart rate was observed during dental treatment.

Sedation, Special Needs Patients

### **Dental Treatment in Patients with Mitochondrial Encephalomyopathy with Lactic Acidosis and Stroke-like Episodes (Melas): A Case Report**

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**Introduction:** In patients with mitochondrial encephalomyopathy with lactic acidosis and stroke-like episodes (MELAS) whose aerobic metabolism is already compromised, anesthetic management should be designed to minimize stress on the metabolic system during dental treatment.

**Case report:** We report a 13-year-old girl with MELAS and history of epilepsy. The patient was taking benzodiazepine as an anti-epileptic drug (AED). The patient was scheduled for multiple dental caries treatments under general anesthesia. Pre-anesthesia examination results were normal. During general anesthesia, we used thiopental and rocuronium for induction, followed by desflurane for maintenance of anesthetic depth. We did not use sodium lactate containing solution for fluid management. After the operation, pyridostigmine was injected to reverse neuromuscular blockade. However, spontaneous breathing was not fully restored for 10 minutes. Additional sugammadex was injected and spontaneous respiration was completely restored. Moreover, a recovery from sedation was not achieved for 30 minutes after the operation. So, we injected flumazenil, and the patient recovered from sedation. The subsequent clinical course until discharge and periodic recall checks were uneventful.

**Discussion:** An increased sensitivity to rocuronium could be observed in some patients with MELAS, and the use of sugammadex could be an effective way to end the effects of rocuronium. Patients taking benzodiazepine as an AED could wake up more quickly from general anesthesia if administered flumazenil.

**Conclusion:** Dental treatment could be successful in a patient with MELAS under considerate general anesthesia.

## Assessment of Dental Fear and Anxiety Using Nitrous Oxide-Oxygen Inhalation Sedation in Children Visiting BPKIHS

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**Background:** Children frequently suffer from dental problems. It is very challenging to provide effective and efficient dental treatment to them because of Dental Fear and Anxiety (DFA). DFA leads to adverse behavior during treatment. Nitrous oxide-oxygen inhalation sedation (NOIS) is a safe and effective means of managing children's DFA when used appropriately. The objective of this study was to assess and compare DFA levels in children before and after treatment using NOIS.

**Methods:** An interventional clinical trial was conducted among 67 healthy children aged 5-14 years of both genders who visited our outpatient department with Frankl's positive and negative behavior. Routine dental treatment was completed under NOIS. The DFA was measured using Children's Fear Survey Schedule-Dental Subscale (CFSS-DS), Modified Child Dental Anxiety Scale (MCDAS), and Facial Image Scale (FIS) before and after the treatment under NOIS.

**Results:** The mean age of children was  $9.07 \pm 2.67$  years. Forty children underwent invasive and twenty seven non-invasive dental treatment. Mean change in score and standard deviation of change of CFSS-DS and MCDAS were  $18.23 \pm 8.60$  and  $12.52 \pm 5.40$  respectively due to NOIS and which were found a statistically significant reduction in DFA ( $P \leq 0.001$ ). FIS score also found a statistically significant reduction in DFA of children after using of NOIS ( $P \leq 0.001$ ).

**Conclusion:** Our study showed a significant reduction in DFA in children after treatment under NOIS. It was effective to reduce DFA in both invasive and non-invasive dental treatment.

## Sedation

**Treatment Safety and Patient Acceptability of Intravenous Propofol Sedation in Paediatric Dentistry**

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**Background:** Dental anxiety is often a barrier to dental care with reported levels recorded at 5.7-19.5 % of the western adolescent population. Dental anxiety can result in irregular attendance, attending only in pain. It also limits cooperation for routine dental care resulting in referrals to secondary care. Propofol is an advanced pharmacological technique, which is commonly utilised in general anaesthesia as a bolus induction agent. However, in sub-anaesthetic concentrations it can provide tailored sedation by target controlled infusion (TCI) for dental treatment. It has been reported to have superior anxiolysis and quicker recovery compared to midazolam in the paediatric population.

**Methods:** A retrospective observational study of all paediatric patients treated during 2017-18 at the University Dental Hospital Manchester UK adolescent intravenous sedation clinic. The study aimed to assess service utilisation, demographics, treatment outcomes and patient safety.

**Results:** A total of 145 patients (mean 14.4 years, range 11-17 years) were treated with a success rate of 95% of all treatment episodes. Four treatments were postponed, eleven were abandoned due to lack of cooperation and two opted for treatment under LA and inhalation sedation. Average treatment time was 34 minutes. All patients were routinely discharged with no post-operative complications, the lowest oxygen saturation recorded was 97% spO<sub>2</sub>.

**Conclusion:** Propofol TCI sedation provides an alternative sedation modality to general anaesthetic in the successful management of dentally anxious adolescents. It allows quadrant dentistry and complex surgical treatments to be completed for the anxious adolescent patient.

### Can Children Remember any of the Dental Procedure under Sedation?

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**Background:** Sedative-related amnesia is desirable for patients who are undergoing uncomfortable procedures. The less an individual remembers an aversive stimulus, the lower the chance of developing negative behavior in future appointments. There is a lack of studies that explore amnesia in a qualitative approach, which permits a more comprehensive understanding of the topic. Using a quantitative and qualitative approach, the aim of this study was to explore the occurrence of amnesia in children who were sedated for dental procedures.

**Methods:** Children aged three to seven years who were treated for caries under sedation with midazolam or midazolam/ketamine were included. During the appointment, amnesia was assessed via a three-stage method using pictures/animal toy. One day later, parents answered questions about their children's amnesia. One week later, children underwent a face-to-face interview. Data were analyzed through descriptive statistics and content analysis.

**Results:** A total of 35 children (age: 36–76 months) and their caregivers participated in the quantitative analysis, and 28 children in the qualitative approach. Most children presented amnesia of the dental procedure (82.9%, n=29/35) and most parents reported that children did not remember the intervention (52.9%, n=18/34). Three categories emerged from the interviews: clearly remembered, did not remember, or doubtful remembrance. The major theme that emerged indicated that few of the children could remember details of the procedures experienced during dental sedation.

**Conclusions:** As some children keep their memories of the dental procedure under sedation, the dental team must minimize the occurrence of potentially traumatic events during dental sedation visits.



## Oral Health-Related Quality of Life Questionnaires for Children and Adolescents Following Dental Treatment under General Anesthesia

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**Background:** Oral health is an integral part of the individual's overall health and is fundamental for their quality of life. The evaluation of the oral health-related quality of life (OHRQoL), through questionnaires, allows determining the impact of dental treatment with general anesthesia on the well-being of children, adolescents, and their families.

**Methods:** An electronic search was carried out during 2019 in PubMed, EBSCO, Epistemonikos, Scopus, Trip Database, and Cochrane Library databases; and in Google Scholar retrograde search. MeSH terms and keywords were used as "children", "child", "youth", "preschool," adolescents ", " teenager ", " quality of life ", "well-being", " health-related quality of life ", "dental treatment", "dental care", "general anesthesia" and "general anesthesia", combined with Boolean terms AND and OR, without language or year limit and excluding adult population and expert opinions.

**Results:** There were 37 articles selected from a total of 389, between 1999 and 2019 in English. The questionnaires reported were: Early Childhood Oral Health Impact Scale (ECOHIS) (29%), Family Impact scale (FIS) (20%), Parental Perceptions of Child Oral Health-related Quality of Life Questionnaire (P-CPQ) (18 %), Unvalidated questionnaires (16%), Short P-CPQ-16 and P-CPQ-8 (7%), Short FIS-8 (7%) and Child Perceptions Questionnaire (CPQ 11-14) (2%).

**Conclusion:** The OHRQoL assessment instruments allow measuring the impact on the quality of life of the patient and the environment. The most reported questionnaire in literature was ECOHIS, aimed at parents of children between 2-5 years old and stands out for including the impact section of the child and family.

### **Compare the Effectiveness of Topical Anesthetic Gel and Acupressure Points as a Pre Injection Anesthetic Technique in Pediatric Dental Patients**

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**Background:** Adequate Pain management is mandatory for effective treatment in pediatric patients. There are several pharmacological and non-pharmacological pre injection anesthetic technique of which Lignocaine hydrochloride 2% gel is the most commonly used. Recently Acupressure has been proven to alleviate pain associated with needle prick. The aim of the present study is to compare the effectiveness of topical anesthetic gel and acupressure points as pre injection anesthetic techniques in pediatric dental patients.

**Methods:** After obtaining ethical clearance from institutional review board (SRMU/M&HS/SRMDC/2020/PG/002). Sixty patients aged 6-8 years were recruited for study and randomly divided into three groups of 20 each. Group I patients received topical anesthetic gel (2% lignocaine hydrochloride) as pre injection anesthetic. For Group II patients Acupressure beads were placed in Shenmen, Xiaguan, Yingtang(extra one) points for 30mins as pre injection anesthetic. Group III patients received both Acupressure and topical anesthetic gel . Videos were recorded during the procedure and were evaluated using FLACC pain scale by the trained individual blinded from the study. The data was subjected to statistical analysis.

**Results:** Group III showed least FLACC scores and is statistically significant ( $p < 0.05$ ). When comparing Group I and Group II FLACC scores were not found to be statistically significant ( $p = 0.38$ ).

**Conclusions:** This study demonstrates that Acupressure is equally as effective as topical anesthetic gel. Acupressure and topical anesthetic gel showed maximum reduction in FLACC scores. Therefore, Acupressure as an adjuvant with topical anesthetic gel is effective for pain management in treating pediatric patients.

### Comparative Assessment of Efficacy and Recovery with Minimal Sedation using Oral and Intranasal Midazolam in Children

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**Background:** Pharmacological behaviour management plays a major role in providing quality dental care for anxious young children. Midazolam is widely used as sedative and anxiolytic both by oral, intranasal and intravenous routes for dental procedures in children with appropriate margin of safety. In this study, our aim was to compare and assess the efficacy and recovery during procedural sedation by administering Midazolam via oral route vs intranasal route in ASA-I children in clinical setting.

**Methods:** 30 Healthy pediatric patients with dental problems, exhibiting Frankl's behavior rating score II or III between the age group of 2 to 6 years reporting to the hospital requiring dental treatment were enrolled in the study. Informed consent was obtained and the study was done at two separate centres. Group A received Oral Midazolam (0.4-0.5mg/kg) as a sole sedative agent to achieve minimal to moderate sedation. Group B received Intranasal Midazolam(0.2mg/kg) as sole sedative agent to achieve minimal to moderate sedation. The outcomes were recorded using HOUP T SEDATION RATING SCALE and MODIFIED VANCOUVER SEDATIVE RECOVERY SCALE.

**Results:** Both oral and intranasal routes of sedation showed promising results. Children had shown good behavior throughout the short dental procedures and quick recovery which is definitely a boon for pediatric dentistry.

**Conclusions:** Within the purview of this study, the authors conclude that minimal sedation using oral midazolam and intranasal midazolam for short dental procedures is very effective and shows safe recovery. Depending on case selection both routes of administration shows effective and adequate sedation with good post-operative outcomes.

**Decoronation Treatment of Pediatric Patients with Special Health Care Needs**

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**Introduction:** The special health care needs include any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity.

Health care for individuals with special needs requires specialized knowledge, in many cases, without the need for sedation or general anesthesia.

In these patients the risk of dentoalveolar trauma is high with various consequences for permanent dentition

**Case Report:** An 11-year-old boy with special health care needs who had a complicated crown fracture of his two permanent upper incisors (1.1 and 2.1). Endodontic treatment of 1.1 and decoronation of 2.1 were performed with a provisional in cantilever. This treatment was performed under laryngeal mask.

**Discussion:** The decoronation of a resorbing anterior tooth will allow it to serve as a matrix for alveolar bone formation and preserve an otherwise resorbing alveolar process, thereby leaving an environment of bone and soft tissue that is optimal for both single implant insertion or fixed prosthesis. Finally, decoronation, if indicated, appears to be cost-effective in comparison with non-replantation combined with subsequent repeated prosthetic tooth replacements owing to vertical alveolar growth of adjacent ridge areas.

**Conclusion:** Good management of dental trauma in special health care need patients can be performed in all patients with a good multidisciplinary team.

### Duration of Dental Treatment and Drugs Related to Utilisation of General Anaesthesia

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**Background:** One of the most common reasons for administering general anaesthesia (GA) among children is dental treatment with complete oral rehabilitation. These children tend to associate dental procedures with anxiety and pain due to which pharmacological means of behavioural management such as conscious sedation and GA are considered. This study aims to determine the duration of dental treatment performed under GA among paediatric dental patients who had undergone complete oral rehabilitation, and to establish the types of anaesthetic agents used for these procedures.

**Method:** This is a retrospective study where clinical data was retrieved from records of paediatric dental patients aged 18 years old and below who had undergone GA from November 2015 until February 2019 at AMDI, USM, Malaysia. The study was approved by the Internal Review Board of Human and Ethics Committee, USM prior to its commencement. Demographic details including date of GA, duration of GA and drugs used were recorded in a data collection sheet. Descriptive and categorical data were analysed using SPSS software version 24 (IBM, USA).

**Results:** A total of 113 subjects were treated under GA where a small group of patients (3.5%) were treated less than 60 minutes, while 32.7% were treated between 61 to 120 minutes, majority of the patients (63.7%) were treated between 121 to 180 minutes. Fentanyl and Rocuronium was used in all patients (100.0%). About 80.5% of the patients were administered morphine. Out of 113 subjects, only 8.0% were administered other drugs such as antibiotics, and further medications for their prevailing medical conditions.

**Conclusion:** The minimum time taken for the procedure was under 15 minutes whereas maximum time taken was about 3 hours, depending upon the patient's treatment needs. On the other hand, a combination of agents was used to provide pain free dental treatment experience for paediatric patients.

## Sedation

**Predictable Sedation: Safe Administration of Midazolam and Nitrous Oxide for Paediatric Patients under in the Dental Practice**

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**Background:** Behaviour management for paediatric dental patients is challenging for children and the dentist. Sedation is often needed in paediatric dentistry, when the patient presents with behavioural impairment. Sedation with different drug regimens for the delivery of dental care has been successfully executed. Some of the most popular regimens include: nitrous oxide inhalation sedation with oxygen, midazolam or the combination of both. These are the most popular sedation modalities considered to be the closest to the ideal sedation modalities used by paediatric dentistry.

**Literature review:** Pediatric sedation is advised when behavioral strategies have failed. Often coping skills are not sufficient and children experience fearful behavior. Ideally produces sleepiness, amnesia drowsiness with euphoria and muscular relaxation, but not full anesthetic sleep. One of the more favourable techniques is the combination of inhalation sedation with midazolam. Cardio vascular and upper respiratory functions are unaffected however cognitive function and physical coordination is impaired. General anaesthesia in paediatric patients is always risky. The popularity and usage of Midazolam has increased in the past decade due to its safety record and nature of being short acting. Oral dosage: 0.3-0.7mg/kg. Children's behaviours in the dental office are becoming more difficult to manage which is aggravated by parents becoming more increasingly particular about their child's experience.

**Conclusion:** Preserving the child's trust by providing minimal traumatic treatment is the main objective of paediatric dental sedation. We will probably see the need for safe dental sedation grow in the future given to parent preference and the towering incidence of paediatric dental disease.

## Sedation Regimes for Paediatric Dental Treatment

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**Background:** The coping skills of children are often not sufficient to deal with dental treatment, and sedation is advised when non-pharmacological behavioral strategies alone have failed. The need for safe dental sedation is growing with the increasing incidence of dental disease in children.

**Literature review:** Ideally, sedation should induce sleepiness, euphoria, analgesia, and muscular relaxation but not full anesthesia. Sedation of children with different drug regimens for the delivery of dental care has been successfully executed. Examples of regimens are nitrous oxide inhalation sedation, oral midazolam, intramuscular ketamine and intravenous propofol.

Drugs administered intramuscular or intravenous are very effective but invasive and therefore less popular for paediatric patients. The potency of these drugs also requires active monitoring. The popularity and usage of Midazolam has increased in the past decade due to its safety record and short acting nature, however, has reports of unpredictable results. Nitrous oxide inhalation sedation is preferred because of its ability to be titrated or reversed if necessary, but lack in potency. A combination of the two regimes have proven to be even more very effective.

**Conclusion:** Nitrous oxide inhalation sedation with oxygen, midazolam or the combination of both techniques are the most popular sedation modalities used by paediatric dentists and considered to be the closest to the ideal for sedation in paediatric dentistry. Safety remains a concern with any form of sedation and it is imperative that all practitioners should be qualified and experienced in the techniques they use.

## Sedation

**Effect on Pain Perception using Cooled Topical Anesthetic Gel in Pediatric Patients prior to Infiltration Anesthesia : A Comparative Study**

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**Background:** Local anesthetic injection is one of the most feared and anxious procedures in pediatric dental practice. Cryoanalgesia refers to localized cooling of peripheral nerves for pain relief. Cooling results in vasoconstriction, reduction in tissue metabolites, inflammatory mediators and neuropeptides, thereby reducing pain. The aim of this study was to compare the effect of cooled and uncooled topical anesthetic gel before infiltration anesthesia in assessing pain perception in pediatric patients undergoing dental treatment procedures.

**Methods:** In this split mouth study, 32 children aged between 6-9 years who required bilateral local anesthesia administration were selected. Before infiltration anesthesia, cooled topical anesthetic gel was applied on one side in the first visit followed by application of uncooled gel on the contralateral side in the subsequent visit. The patients were asked to individually rate their pain experience on each side using the Wong Bakers pain rating scale. Anxiety was assessed using a pulse oximeter and FLACC scale. The data obtained was tabulated and statistically analyzed.

**Results:** Patients reported less pain on the Wong Bakers pain rating scale when using cooled topical anesthetic gel. Assessed anxiety levels were also lower using the pulse oximeter and FLACC scale for the same group.

**Conclusion:** Application of cooled topical anesthetic gel before infiltration anesthesia significantly reduced the pain perception in pediatric patients when compared to the uncooled topical anesthetic gel.



**Local Anesthesia Techniques in Pediatric Dentistry**

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**Background:** Fear of pain can become an obstacle to successful dental treatment in children. Dentists need to be aware of this challenge and develop effective techniques to reduce pain for their patients. Even though pain associated with local anesthesia generally subsides following administration, delivery of local anesthetic can be challenging.

**Literature Review:** The conventional way of delivering local anesthesia using syringe and needle can produce anxiety and apprehension in some patients even before it commences. Fear of injections may lead to reluctance on the part of the child or parents to seek treatment in the future. Hence, it is important to be informed about a range of effective techniques to minimize pain associated with local anesthesia delivery, such as computer controlled local anesthesia delivery systems, use of various topical anesthetics, jet injectors and laser analgesia. This presentation highlights a number of techniques for administering local anesthesia.

**Conclusions:** The key to managing children's anxiety associated with dental treatment lies in the effective delivery of local anesthesia. This poster reviews published and clinically established modes of local anesthesia delivery, emphasizing techniques that go beyond the use of conventional needle and syringe.

**Chair Side General Anaesthesia: A Boon to Pediatric Dentist**

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**Introduction:** Behavior management plays a major role in success of dental treatment in pediatric patients. In routine dental practice we encounter children with varieties of behavioral problems. Some children may not cooperate as they are too young and some may have certain medical conditions which prevent them from obtaining dental treatment. Even though non-pharmacological means of behavior management has proved to be effective tool in managing the uncooperative children, its use is limited in medically compromised children. Dental sedation and general anesthesia are the treatment options in such cases.

**Case reports:** This paper describes two cases of early childhood caries which were treated under general anesthesia due to their high non-cooperative chair side behavior. In both cases it was definitely negative behavior according to Frankel's rating scale. Complete oral rehabilitation was done which included restorations, fluoride application and extraction of grossly decayed teeth that had a poor prognosis. Ten days after procedure both children were recalled and oral hygiene status was assessed. Removable functional space maintainers were given and oral hygiene instructions were reinforced

**Discussion:** Careful selection of cases is out most important for success of general anesthesia cases. We need to work in collaboration with pediatrics and anesthesia personnel to get clearance for the treatment to avoid any untoward complications.

**Conclusion:** General anesthesia is a safe mode of treatment for disabled children who require emergency dental care.

# *Special Needs Patients*

## Special Needs Patients

**Relationship Between Oral Function of Stomatognathic System with Oral Health-Related Quality of Life in Stunting Children**

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**Background:** Stunting is defined specifically as a condition of children aged 0–59 months, with height by age being below minus two standard deviations from the median standard based on WHO. Stunting occurs due to malnutrition for a long time in the first 1000 days of life. Stunting in infancy that fails to catch up growth will manifest into stunting during elementary school children. Stunting can affect cognitive decline and oral motor coordination. Oral motor skills play an important role in the oral function of the stomatognathic system (mastication, swallowing, and speech). Early attention to the impaired oral function of the stomatognathic system can avoid complications of nutritional status and quality of life of children. The purpose of this study was to determine, analyze, and evaluate the relationship between oral stomatognathic function (mastication, swallowing, and speech) and Oral Health-Related Quality of Life (OHRQoL) in stunting children.

**Methods:** The research conducted was a correlative type of research on 58 stunting children aged 7-12 years in the Public Elementary School coverage of Puskesmas Pasir Jambu Bandung Regency. The oral function of the stomatognathic system was evaluated by Adapted Orofacial Myofunctional Assessment Protocol and OHRQoL with Child Oral Health Impact Profile Short Form (COHIP-SF 19).

**Results:** The dominant method of mastication without lip closure in short stunting children is 14 people (73.68%), while stunting children are very short in 34 people (94.87%). The mastication speed is slow in all stunting and very short children. The average chewing speed of stunting children is 17s / 0.05gr, whereas in children stunting is very short 24s / 0.05 gr. Overall stunting when swallowing solid and liquid food shows one or more inadequate ingestion activities. The whole child stunting while talking shows one or more activities of speech function that are inadequate. The results of the study were analyzed statistically by Spearman's Rank Correlation and Kendall Coefficient of Concordance method. The results showed the research subjects had a significant relationship on each variable and the three oral function variables of the stomatognathic system (mastication, swallowing, and speech) with OHRQoL with p-value 0.05.

**Conclusion:** The study concludes that oral stomatognathic function (mastication, swallowing, and speech) has relationship with OHRQoL in stunting children.

## Oral Health Status of HIV-Infected Children and Adolescents undergoing Antiretroviral Therapy: A Systematic Review and Meta-Analysis

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**Background:** Antiretroviral therapy (ART) has increased the survival of HIV-infected children, but might bring in other oral health-related side effects and raise their risks to oral diseases. The review aimed to compare the oral health status of HIV-infected children undergoing ART with healthy controls and treatment-naive HIV-infected children.

**Methods:** Dual independent screening and study selection from four electronic databases and manual searches, data extraction, risk of bias assessment, and evaluation of quality of evidence using Grading of Recommendations Assessment Development were performed.

**Results:** Nineteen studies were found eligible for qualitative synthesis and 15 were included in the quantitative analysis. HIV-infected children taking ART had significantly higher prevalence of periodontal diseases (OR=3.11,95% CI=1.62,5.97), mucosal hyperpigmentation (OR=20.35,95% CI=3.86,107.39) and several orofacial-related opportunistic infections, than healthy controls. No significant difference regarding caries prevalence and tooth development was identified. Those with CD4+ T cell counts below 250cells/mm<sup>3</sup> were more likely to manifest opportunistic infections, while the duration of medications had minimal influence on the prevalence of orofacial opportunistic infections. The quality of evidence of each outcome was graded as low or very low due to imprecision, as the results were mostly derived from small-scale studies.

**Conclusions:** Due to limited number of small-scale studies, the quality of evidence informing the oral health status of children taking ART or HAART is very low. The current findings did not identify HIV and HAART status as a predisposing factor to dental caries, but might increase the risk of periodontal diseases, mucosal hyperpigmentation, and candidiasis.

### Nasoalveolar Modeling Clinical Case

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**Introduction:** When patients use this modeler improves nutrition and nose shape which is the most important thing. On the other hand, we approximate the alveolar processes.

**Case report:** patient Maria Isabel Piña Flores, diagnosis of bilateral cleft lip and palate, age 2 years 7 months. 26-year-old mother G4 P3 0+ Euthoric delivery, adequate prenatal control, without referring pathology with medication, folic acid ferrous fumarate, infection of the urinary tract at 31 weeks of gestation with nonspecific treatment, took ondasetron for 3-5 months, pregnancy of 37 SDG 2,580 weight, size 50 cm cephalic perimeter 32 cm APGAR 9/9 respiratory difficulty, print run Xray. of thorax with infiltrated rounded cardiac silhouette, no heart murmurs, even with polypnea and respiratory distress, depressible soft abdomen, refers to pediatric dentistry for treatment of preoperative orthopedics with nasoalveolar modeler. Referred to dental on July 24, 2018 to start preoperative orthopedic treatment. Only button was used for 4 weeks and then it was continued with a nasal elevator, until December 6, on December 14, 2018, continued in reviews and the palate surgery was performed on January 10, 2020 without complications. Current condition of the cleft lip and palate bilaterally, since prenatal orthopedic treatment began, there has been no respiratory distress.

**Discussion:** It is very important to use the nasoalveolar modeler from birth to facilitate the plastic surgeon the cheiloplasty results.

**Conclusions:** It is very important that patients with cleft lip and palate use the nasoalveolar modeler mainly to shape the nose and later shape the palate, and it is also important to prevent cavities in these patients if we can see them from newborn

## Special Needs Patients

**Case Report of Multiple Dental Injuries in a Patient with Lennox-Gastaut Syndrome**

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**Introduction:** Lennox-Gastaut Syndrome (LGS) is a severe epileptic childhood encephalopathy. Its treatment is complex, mainly due to a multiplicity of epileptic crises, favoring the occurrence of dental injuries. The purpose of this report is to present the clinical management of a patient with LGS who experienced multiple dental trauma, and to discuss the observed dental findings and dental treatment performed.

**Case report:** Patient L.H.D.L., a 15 year-old male, presented with low caries activity, large amount of dental biofilm, mild fluorosis and generalized gingivitis. We observed absence of the teeth 21, 22, 32 and 42, enamel fracture of 12 and 14, and tooth 11 rotated 180 degrees. Basic behavioral management techniques were adopted, and oral hygiene and dietary instructions were given to both patient and his caregiver. Four sessions of prophylaxis and fluoride application were carried out weekly. Endodontic treatment was performed in tooth 12, followed by composite resin restoration of tooth 12, 14 and the palatal side of the rotated tooth 11. At the end, an adhesive prosthesis was placed in the region of tooth 21.

**Discussion:** Despite the difficulties in treating patients with LGS, it is possible to achieve functional and aesthetic results with an accurate diagnosis and treatment, involving a multidisciplinary team trained in care for patients with special needs.

**Conclusion:** The present report highlighted a simpler form of dental rehabilitation treatment which promoted oral health and improved the patient aesthetics within the context of a special needs patient. (Ethics Committee #2014.1.1159.58.0).

**Oral Rehabilitation in a Patient with Jeune Syndrome Presenting with Multiple teeth Agenesis**

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**Introduction:** Jeune syndrome (JS) is a rare disease, with systemic manifestations, such as renal and hepatic insufficiency, retinal pigmentation, and respiratory insufficiency. Etiological factors have not been completely elucidated, but the molecular biology has contributed to the diagnosis and understanding of Jeune syndrome (JS) with DNA sequencing, showing the association among polymorphisms in different genes DYNC2H1 (MIM 603297) and TCTEX1D2 (MIM617353) are the main genes associated with JS. There are a few reports on buccal findings in these patients, here, we present dental anomalies and clinical oral findings in a patient with JS, focusing on a multidisciplinary approach for rehabilitation.

**Case report:** A 15-year-old boy with JS was referred to our dental clinic. Clinical and radiographic examination revealed the presence of dental agenesis, taurodontism, and geographic tongue with lobulations. The treatment plan consisted of preventive, restorative, surgical, and oral rehabilitation.

**Discussion:** We reported a clinical case of JS with oral findings not reported previously. We described teeth agenesis and taurodontism as possible oral phenotypic characteristics of JS. Furthermore, we presented a dental approach for a person who, although young, exceeded the life expectancy of most cases reported in the literature.

**Conclusion:** Rehabilitating function and esthetics promotes a better quality of life owing to improved masticatory function, esthetics, maintenance of oral health, and above all, helps the patient with inter-human relations and improves their self-esteem.



**Restorative Treatment in Patients with Williams Syndrome- 1 Year Follow-Up Clinical Case**

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**Introduction:** Williams syndrome is a congenital disease caused by a microdeletion on chromosome 7 causing a series of striking physical characteristics and developmental abnormalities. Oral findings include enamel hypoplasia, abnormal dental morphology, excess of interdental space and microdontia.

**Case Report:** In December 2018 a 4-year-old patient with WS was referred for dental care at the clinic for patients with special needs at the São Leopoldo Mandic Campinas unit. During the clinical examination, a many active caries lesions and initial lesions were diagnosed and shown to the mother. After signing the informed consent form, the mother received oral hygiene instructions. Being a special patient resistant to treatment in all appointments, he was used to control anxiety through oral sedation with hydroxyzine hydrochloride. The clinical procedures performed were pulpectomy and aesthetic reconstruction of teeth 51,61 with the aid of PVC crowns and nanohybrid composite resine, teeth 71,72,81 82 and 52 also restored with the same material, teeth 75,74,85,84 were restored with glass ionomer cement.

**Discussion:** Children with SW may initially not cooperate and demonstrate resistance to treatment, expressing fear and anxiety. These patients may have open bite, atypical swallowing, diastema, incisor hypomineralization, hypoplasia and enamel agenesis. These characteristics were observed in the present case. Preventively, early dental evaluation and parental counseling are important because the development of caries lesions and endodontic infections can have more serious complications in these individuals, as the high incidence of congenital heart defects increases the risk of subaggressive bacterial endocarditis.

**Conclusion:** It was concluded that the treatment of the patient reached a degree of excellence followed by 1 year without the need for repairment using the materials and techniques proposed for patients with special needs in pediatric dentistry. All the material was donated by voco®, which were: Cleanjoy, futurabond, ionofil plus, grandio and profluorid.

## Special Needs Patients

**Oral Health Education Program (OHEP) done with Robots versus Conventional Dental Approach to Children with Chronic Kidney Disease (CKD): Randomized Clinical Trial (RCT)**

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**Background:** The purpose of this RCT was to evaluate the use of robots in oral health education in children with CKD compared to the oral health education through conventional dental approach.

**Methods:** A total of 132 children with CKD from 6 to 18 years of age, were randomly assigned to a OHEP in hospital environment; group 1 received the OHEP from a dental surgeon (DS) and group 2 received the OHEP from a robot. The primary endpoint measurements were gingival index (GI) and the simplified oral hygiene index (S-OHI) and the secondary endpoint measurements were perception of the quality of life (QoL) and the child and the adolescent acceptance concerning the OHEP. The measurements were conducted at baseline and after one month.

**Results:** Both OHEP approaches were satisfactory to improve the gingival condition in children with CKD, with no significant differences between the groups. In the S-OHI, we had a reduction in the prevalence of poor oral hygiene from 75% to 16% ( $p=0.93$ ) and in the GI a reduction of intensive gingival inflammation from 27% to 5% ( $p=0.34$ ). Regardless of the intervention, there was an improvement of the QoL scores, with no significant differences. Concerning the satisfaction of the child in receiving guidance by the DS or by the robot there was no statistically significant difference ( $p=0.657$ ).

**Conclusion:** The OHEP by means of a robot and/or by the DS is satisfactory and efficient to improve the gingival condition of children with CKD, resulting in the improvement of the patients' QoL.

## Special Needs Patients

**Dental Treatment of Pediatric Patients with Autism Spectrum Disorder, Universidad de los Andes, Chile**

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**Introduction:** Autism spectrum disorders (ASD) are defined as wide continuum of associated cognitive and neurobehavioral disorders, including, but not limited to, three core-defining features: impairments in socialization, impairments in verbal and nonverbal communication, and restricted and repetitive patterns of behaviors. People with ASD can be treated with traditional behavior guidance techniques in many cases, without the need for sedation or general anesthesia. This case report describes a successful treatment of a patient diagnosed with Asperger's syndrome treated with different traditional techniques of conduct guidance in undergraduate education at the Universidad de los Andes health center.

**Case report:** An 8-year-old boy, at social risk, with overweight and ASD. First phase mixed dentition, high cariogenic risk, caries activity (deft: 6, DMFT: 2). Gingivitis associated with bacterial plaque, caries, canine class and bilateral Angle II molar class. Vestibularized incisors and poor habit of mixed breathing.

In 8 sessions the patient received preventive treatment, restorations, pulp treatments and extractions, using the techniques of progressive desensitization, tell show do, distraction and positive reinforcement.

**Discussion:** The inclusive care of a patient diagnosed with Asperger's syndrome should be encouraged through treatment planning and session-by-session management, based on the patient's needs, implying that the use of traditional management techniques should be the first option when treating a pediatric patient. Physical restraint, sedation and general anesthesia techniques should be considered as an option only when traditional management techniques do not work.

**Conclusion:** Traditional management techniques should be the first option when treating all pediatric patients, including patients with ASD.

## Special Needs Patients

**A Careful Planning for Dental Extractions and Space Maintenance in a Child with Hemophilia**

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**Introduction:** In order to provide the safest dental care possible to children with Hemophilia, hemostatic measures are needed: preoperative strategies, intraoperative precautions, and close postoperative management. It is imperative to perform an interdisciplinary approach to address the unique needs of each patient.

**Case Report:** A seven-year-old Mexican boy attended dental service. He presented Hemophilia type A and had been under prophylactic replacement therapy. Clinical and radiographic examination revealed a poor prognosis for primary mandibular left molars, so it was decided to perform extractions. Laboratory tests verified an adequate hematologic state. The day of the surgery, the patient was administered replacement factor. Local anesthesia was achieved, careful luxation and extractions were performed, hemostatic sponge was applied and stabilized with resorbable sutures. Electrocautery was employed and a surgical dressing was placed, covered with a previously designed vacuum-formed splint. After three days, the splint was removed and a lingual arch was placed. Four weeks after surgery, the healing and the space maintainer were found in optimal condition.

**Discussion:** The priority in pediatric dental care must be the health and well-being of the patient, making the best efforts to improve the quality of preventive and curative treatments for children with Hemophilia. An evidence-based research was carried out to know the best bleeding preventive measures, so it was possible to reduce the risks during dental surgery.

**Conclusion:** The dental and multidisciplinary management for children with Hemophilia needs a careful planning in order to provide a safe care, especially when invasive treatments are required.

## Special Needs Patients

**Intra- and Extrabuccal Aspects of Lymphatic Vascular Malformation and Hemangioma in a Child: A Case Study**

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**Introduction:** Hemangioma results from benign proliferation of blood vessel endothelial cells. Lymphangioma is the result of lymph retention in lymphatic vessels, generating a soft and compressible swelling of the tissue. This study reports a case of a patient with cavernous oral hemangioma and cervical-facial lymphatic malformation and describes the dental planning and treatment performed.

**Case report:** A 7-year-old male patient was referred for dental evaluation. The mother reported that the patient was under medical treatment at the hospital because he presented an hemangioma and lymphatic vascular malformation in the buccal region. During clinical examination, vascular malformations were observed in the oral floor. The child reported difficulty in performing oral hygiene due to the lesion, and several caries lesions were found. Dental treatment consisted of teeth restorations, sealants and exodontia of deciduous teeth. Treatment of the vascular malformation and lymphangioma was accomplished using a sclerosing solution (OK-432), followed by the use of propranolol (10 mg., 2x/day).

**Discussion:** Patients with hemangioma and lymphatic malformation may have aesthetic deficiencies, speech disorders, breathing problems, mandibular deformities, increased risk of tooth decay and an increase in the volume of the tongue.

**Conclusion:** Oral health care for patients with hemangioma and lymphatic malformation should include oral hygiene instructions, supervised brushing and guidance on the use of soft brushes to avoid injury to affected areas.

### Mitochondrial and Transcriptome Study of Autistic and Non-Western Diet Children

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**Background:** Autism has been described as a gastrological and neurological condition that is represented by impairments in language and social situations. Recently reported increases in the occurrence of Autism Spectrum Disorder (ASD) has resulted in increased research into the environmental differences between areas with a high occurrence, as in “Western” diet populations, and more locally derived diet populations wherein the rate appears to be significantly less.

**Methods:** Thirty autistic children (USA), ages 6 to 21, were sampled at three different intervals: prior to any preventive care intervention, post-xylitol intervention, and post-probiotic intervention. The sampling consisted of buccal swabs for Mitoswab testing, and saliva for full transcriptomics to determine the entire range of microorganism species and the metabolome. A “Blue Zone” subject component that included 30 Colombian children, ages 6 to 16, who were healthy and within normal behavior standards also had buccal swabbing and salivary sampling performed for comparison. Mitochondrial health and the full transcriptome were analyzed, and artificial intelligence programming was utilized to discern important differences in the microbiome which included bacteria, archaea, fungus, yeast and RNA viruses.

**Results:** Significant between-group differences were noted, and also seen in the temporal data, demonstrating shifts that may have be precipitated by both interventions (probiotics and the polyols). Particular bacterial strains were significantly more prevalent in the autism subject group, including the strain *Achromobacter xylosoxidans* which reduces neurotransmitters by enzymatic degradation. Also of interest was the unexpected finding that verbal skills dramatically increased in 6 of the 30 ASD subjects following xylitol supplementation. The xylitol responders had significant changes to their microbiome and functions (KEGG Orthology) compared to non-responders.

**Conclusions:** The transcriptomic analysis of young people with a confirmed diagnosis of A.S.D. compared to “Blue Zone” children demonstrated significant oral microbiome differences between the groups. In addition, the mitochondrial health and Kegg Orthology functions were also significantly different, with certain enzymes present in the A.S.D. group and not the “Blue Zone” children.

**PJS- Pictorial Scale (PJS-PS): Anxiety Rating Scale for Speech & Hearing Impaired Children**

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**Background:** The strength of pediatric dentistry, which differentiates us from the other fields in dental sciences is “behavior guidance”. Fear and anxiety are primary concerns in pediatric patients and have to be taken into consideration for the speech and hearing impaired children too. In this study, an innovative anxiety scale PJS Pictorial Scale (PJS-PS) was designed for the speech and hearing impaired children. Introducing a newer concept of pictorial representation of most common emotions using sign language in the dental clinic can improve communication and also help in coping up and bringing out positive behavior in this group of special children. The study aimed to validate and assess the efficacy of PJS-PS for speech and hearing impaired children.

**Methods:** A total of 30 children of age 6-12 years from the special school were selected for the study. PJS-Pictorial scale was used to determine the pretreatment anxiety scores in the speech and hearing impaired children.

**Results:** The validity of the PJS-PS in the pretreatment anxiety in the assessment of child`s dental anxiety is supported by expert opinions, value of frequency of choices and receptiveness by the children.

**Conclusions:** The PJS-PS can be reliable anxiety assessment scale for measuring child`s dental anxiety among speech and hearing impaired children. It can be used in combination with other methods as well to improve assessment of dental anxiety.

### The Impact of Inflammation in Cerebral Palsy

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**Background:** Gut and oral inflammation has an impact on overall health, placing subjects with Cerebral Palsy (CP) at risk to acquire chronic conditions and infections. We aimed to investigate how inflammatory levels were impacted by clinical factors controlling both oral and gut phenotypes and how much this impacts on their quality of life (QOL).

**Methods:** We recruited a total of 93 subjects aging from 5-17 years. Subjects were assigned as CP with constipation (G1, n=30), CP without constipation (G2, n=33), and controls without CP with constipation (G3, n=07) and without CP and without constipation (G4, n=23). We evaluated the salivary cytokine levels (TNF- $\alpha$ , IL-1 $\beta$ , IL-6, IL-8, IL-10). Statistical significance was evaluated by Kruskal Wallis analysis.

**Results:** Inflammation was more severe for patients in G1 (p 0.001), presenting salivary IL1 $\beta$  levels with the highest correlation with constipation (p 0.05). A significant relationship was found between the type of medication, in which subjects taking gamma-Aminobutyric acid (GABA) and GABA+ (GABA in association with other medication) were more likely to be constipated than the other groups (p 0.01). Subjects in G1 presented the lower mean score of Caregiver Priorities and Child Health Index of Life with Disabilities ( $49.0 \pm 13.1$ ) compared to G2 ( $71.5 \pm 16.7$ ) when compared to G3 ( $88.9 \pm 7.5$ ), and G4 ( $95.5 \pm 5.0$ ) (p 0.01).

**Conclusions:** Collectively, the results suggest that saliva inflammatory levels were linked to gut constipation, and the clinical impact of medications, in addition to affecting QOL.



## Special Needs Patients

**Effectiveness of Three Different Oral Health Education Modalities among Children with Cerebral Palsy (CP): A Comparative Study**

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**Background:** Cerebral Palsy (CP) is considered as most common motor control disability in Pediatric age group that affects muscle tone, movement and motor skills. Children with CP possess high risk to oral diseases due to their impaired cognitive and motor control necessary for oral hygiene maintenance. Due to paucity of studies concerning specific oral health interventions among special health group like CP, we aim to evaluate the effectiveness of different oral health education modalities on oral hygiene status of CP children.

**Methods:** A total of 60 children with CP, between 8 to 15 were randomly divided into three groups based on different oral health education modalities as, Group A: Verbal instructions, Group B: Demonstration using model and Group C: Demonstration using audio-visual aid. Each group was followed for a period of 4 weeks, and the oral hygiene status was recorded at the end of 2 weeks and 4 weeks.

**Results:** The mean OHI(S) score among the groups of children was compared at baseline, 2 weeks, and 4 weeks. Overall Mean Score at baseline was 3.16 which reduced to score of 2.21 at the end of 4 weeks. Audio-visual Group showed significant reduction in the OHI(S) score at 4 weeks, when compared to the other two groups ( $p=0.035$ ) (CI=0.044-1.470). At 4 weeks, Group C had significantly lower DI scores than group A ( $p=0.026$ ) (CI=0.44-.0.836) and group B ( $p= 0.001$ ) (CI=0.219-1.011).

**Conclusion:** Audio-visual method for oral health education is highly recommended to maintain the oral hygiene of children with CP.

### Breastfeeding and Anemia Rates in Children with Orofacial Clefts: Experience of a Brazilian Service

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**Background:** Feeding children with cleft lip and/or palate is challenging in early childhood, since difficulties in the suction mechanism may impair breastfeeding and swallowing process. Hence, these children can be more susceptible to malnutrition, anemia and infections. This study aimed to assess the prevalence of breastfeeding and iron-deficiency anemia regarding the presence of different types of orofacial clefts in children.

**Methods:** Data about the patient's characteristics, presence and classification of cleft lip and palate, and breastfeeding and anemia reports were collected from medical records (January 2009 to December 2018) of patients attended at the Division of Pediatric Dentistry of Center for Rehabilitation of Craniofacial Anomalies (Pró-Sorriso - UNIFENAS). Statistical analysis was performed by the Chi-square test (P 0.05).

**Results:** The 210 medical records included in the study were divided into the groups: G1- Pre-incisive foramen clefts (n=35); G2- Trans-incisive foramen clefts (n=45); G3- Post-incisive foramen clefts (n=43); G4- Rare facial clefts (n=9); and G5- Non-cleft control group (n=78). Cleft groups (G1-G4) showed lower rates of breastfeeding than G5 (P0,01). Breastfeeding records were higher in G1 compared to other types of orofacial clefts (P0.01). Groups G2 and G4 showed higher anemia records than G5 (P=0.015). There was no statistically difference regarding anemia records between the different types of orofacial clefts (P=0.123).

**Conclusions:** Breastfeeding process of children with orofacial clefts requires assistance of health care providers and anemia is most likely to occur in children with trans-incisive foramen and rare facial clefts than in non-cleft children.

## Special Needs Patients

**Dental Considerations in Patients with Loeys-Dietz Syndrome: A Review of the Literature and Case Report**

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**Introduction:** Loeys-Dietz Syndrome (LDS) is a rare connective tissue disorder with an autosomal dominant pattern of inheritance, linked to heterozygous mutations in six genes from the transforming growth factor beta receptor complex. The classical syndrome characteristics include aortic aneurisms with generalized arterial tortuosity, hypertelorism and cleft palate or bifid/ broad uvula. LDS is also associated with a wide range of skeletal, craniofacial, cutaneous and ocular abnormalities, as well as allergic, atopic and inflammatory diseases. Common oral findings include high arched and/or narrow palate, enamel defects and class II skeletal malocclusion.

**Case Report:** The comprehensive dental management of an adolescent patient with LDS is described. Typical oral manifestations of the condition such as high arched palate, bifid uvula, hypodontia, delayed dental development and generalized enamel defect causing significant sensitivity are demonstrated in this case. The report provides a description of the wide range medical and dental considerations taken to provide safe delivery of the patient's oral care. The restorative rehabilitation of the patient's generalized enamel defect will be shown.

**Discussion:** The existing literature related to oral manifestations and dental management considerations of patients with LDS is reviewed. The challenges that dental practitioners may face when providing treatment for these patients are discussed.

**Conclusion:** Dental management of patients with LDS is complex and includes approaches to prevent medical complications, as well as considerations for safe delivery of dental care.

### A Web Content Analysis on Cleft Lip and Palate Surgeries

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**Background:** Treatment for cleft lip and palate begin early in life and include elective surgical procedures as well. Traditionally the decision-making process was dominated by health care practitioners. With abundant sources of information available on internet, the paradigm is shifting towards a shared decision-making process. The aim of the present study was to assess the reliability of websites on cleft lip and palate surgeries using DISCERN tool.

**Methods:** The Google search engine was used to identify websites displaying information on cleft lip and palate surgeries. Duplicates, videos, blogs, newspaper content, etc were excluded. All included websites were assessed for quality of health information provided using the DISCERN tool by two independent reviewers. The readability of the websites was assessed using the Flesch-Kincaid readability scores. The web pages were also evaluated based on characteristics like position of web page on search result, presence of health on net seal, etc.

**Results:** A total 38 unique websites were assessed. About 11 websites were excluded due to different reasons. The Kappa value among the reviewers for inclusion of websites was 1 and for DISCERN scoring was 0.89. Around 68% of websites had DISCERN score 26. The overall scores ranged from 13 to 53 with mean score of 48.7(SD=6.54).

**Conclusion:** Guiding patients to use validated websites on cleft lip and palate surgeries will aid in shared decision-making process.

**Restoration of Oral Function in Preterm Low Birth Weight after Prolonged Orotracheal Intubation**

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**Introduction:** It is well established in the literature that the neonatal intensive care, such as artificial ventilation through oro-tracheal intubation may cause some important changes in the oral anatomy and functions. The purpose of this report is to present the transdisciplinary treatment of the oral alterations in an extremely preterm and low weight infant (596 g) who remained with oro-tracheal intubation during 2 months and 5 days of corrected age.

**Case report:** An extremely preterm and low weight (596g), 24 weeks suitable for gestational age, who developed respiratory distress syndrome complicated by pneumothorax and bronchopulmonary dysplasia, remaining on mechanical ventilation for 74 days, nasal CPAP for 14 days and home oxygen dependence. Also presented difficulty in the introduction and progression of the enteral diet, presenting necrotizing enterocolitis with intestinal resection, compensated food intolerance with the use of extensively hydrolyzed formula and incoordination with breathing-suction-swallowing. During hospitalization, received parenteral nutritional support for 46 days and then started speech therapy for enteral diet transition up to approximately 36 weeks of corrected age. Discharged from the hospital with nutritional hypercaloric diet support through a naso-gastric tube, with 2 months and 5 days of corrected age, weighing 3780g and 51cm long. An orofacial motor therapy was carried out by speech therapist and pediatric dentist. Breastfeeding was intensively worked out, as well as oral exercises performed by different nozzles and digital compression therapy to stimulate the growth of the premaxilla, palate and mandible. Monitoring the teeth eruption, the diet and different textures was oriented to adapt the symmetrical growth of the arches.

**Discussion:** Since the long period of the use of a nasogastric tube and mechanical ventilation can cause changes in function and oral anatomy, an orofacial motor therapy is important to establish the oral function after a long period of intensive care.

**Conclusion:** After the orofacial motor therapy carried out with the transdisciplinary team including a pediatric dentist, the patient presented a very satisfactory evolution of oral development, presenting arches with harmonic growth, normal palatal anatomy and good dental occlusion.

## Oral Health Conditions in Children with Medical Complexity: Comparison between Home Care and Hospital Care

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**Background:** Children with medical complexity (CMC) have functional dependence and systemic dysfunctions that affecting the quality of life. There is little data about oral health conditions in CMC. The study aimed to compare oral health conditions and the cariogenic potential of diet in children with medical complexity monitored at home (n = 14) or under hospitalization (n = 14).

**Methods:** In this cross-sectional study, one examiner assessed the presence of visible plaque and calculus, the presence of caries, gingival hyperplasia and gingival bleeding. The cariogenic potential was assessed using a questionnaire applied to caregivers, considering the consumption of pasta (with and without sucrose), sweets, cereals and their frequency of ingestion. The Chi-square and Fisher's Exact tests were used, considering a significance level of 5%.

**Results:** There was a statistically significant difference between groups for presence of calculus (p = 0.001, home - 78.6% / hospital - 14.3%) and gingival hyperplasia (p = 0.037, home - 50.0% / hospital - 14.3%). For caries, no statistical difference was observed between groups (p 0.05). In addition, there was a difference in feeding rout (p = 0.010), food consistency (p = 0.014) and cariogenic potential (p = 0.010).

**Conclusions:** It could be concluded that pediatric patients with medical complexity monitored at home showed worst periodontal conditions and the children under hospitalization presented diet with greater cariogenic potential.

### Oral Health Related Quality of life in Children with Acute Lymphoblastic Leukaemia undergoing Chemotherapy according to their Caregiver's Perceptions: A Cross Sectional Study

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**Background:** Chemotherapy in children with acute lymphoblastic leukaemia (ALL) can lead to many oral manifestations such as oral mucositis and periodontal inflammation, which may affect negatively their quality of life. The aim of this study was to assess the impact of the parental perception oral health related quality of life (OHRQoL) in children with ALL undergoing chemotherapy.

**Methods:** Parents/caregivers of 43 children aged 6-14 years old attending the Instituto Nacional de Neoplásicas, Lima-Perú were invited to participate in the present study. A calibrated examiner conducted the clinical assessment for dental caries (dmft/DMFT), dental plaque (Silness & Løe Index), mucositis (WHO Grading Scales) and candidiasis in children undergoing chemotherapy. Parent-Caregivers Perception Questionnaire (P-CPQ) was applied using face-to-face interview. Poisson regression analysis was conducted to evaluate the association between independent variables and total scores ( $\alpha=5\%$ ).

**Results:** Mucositis classified as grade 1 and 2 was associated with a negative impact on P-CPQ total scores (RR=1.34; p=0.001 and RR=1.99; p0.0001; respectively). Moreover, a higher fathers' level education and family income demonstrated a worst impact on total PCP-Q scores (RR=1.46; p

**Conclusion:** According to parents/caregivers' perceptions, mucositis impact negatively on the OHRQoL of children with ALL undergoing chemotherapy, but dental caries did not impact the OHRQoL in this population.

### Salivary Urea Level and Dental Calculus Deposition in Paediatric Patients with Chronic Kidney Disease Stage 5

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**Background:** Advancement in the medical field has led to an increase in the number of surviving children with Chronic Kidney Disease (CKD) stage 5. Their elevated salivary urea level has been postulated as a possible contributing factor to higher calculus deposition seen in these patients. This may jeopardise their periodontal health and complicate possible kidney transplant opportunity.

**Methods:** Paediatric patients with CKD stage 5 on dialysis and matched healthy controls were recruited from a tertiary medical centre. Intraoral examination was performed for oral hygiene status and calculus deposition. Their daily oral hygiene practices were also recorded. Unstimulated saliva samples were collected for quantitative analysis of urea concentration. Other related clinical and laboratory information were extracted from their medical records.

**Results:** A total of 33 CKD stage 5 paediatric patients and 66 matched healthy controls were included in the study. Majority (60%) of the participants from both groups had fair oral hygiene. There was no significant difference in oral hygiene status between patients and healthy controls ( $p=0.09$ ). However, calculus deposits were found to be significantly higher in patients (CI-S,  $p=0.04$ ; VMI,  $p=0.02$ ). In terms of association between calculus deposition and salivary urea levels, oral hygiene habits, type and duration of dialysis in CKD stage 5 paediatric patients, no statistically significant association was observed ( $p0.05$ ).

**Conclusions:** Even though increased salivary urea level was suggested as one of the contributing factors for calculus deposition, the heavier calculus deposition in CKD stage 5 paediatric patients in this study was not associated with their higher salivary urea level.



### Voice of the Voiceless

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**Background:** Currently, there is growing interest in the use of art as a means of facilitating communication with children. Several authors have suggested that an appropriate way to collect information about children's perceptions and experiences is by means of projective self-report techniques such as drawings. Children's drawings and narratives can provide a unique window into their inner experiences, particularly when they have experienced anxiety.

Hence, the aim of this study was to evaluate the efficacy of drawings as a measure of anxiety in speech and hearing impaired children during dental treatment.

**Methods:** Speech and hearing impaired children aged 4-13 years participated in the study. During the first therapeutic session which involved oral prophylaxis, the child's behaviour was recorded using the Frankl's behaviour rating scale and Sound Eye Motor (SEM) scales. Then, the child was instructed to draw a picture of what they observed in the dental clinic environment and the pictures were scored using Child Drawing Hospital (CD:H) score sheet. In the next visit the restorative procedures were done and Frankl's score and SEM score were recorded again and compared with the scores of the first visit.

**Results:** A statistically significant correlation was observed between CD:H scores and Frankl and SEM ( $p < 0.05$ ). It was also noted that the behaviour of the children improved significantly after the drawing was done ( $p = 0.00$ ).

**Conclusion:** Drawings can be used as a measure of anxiety and also to shape the behaviour of speech and hearing impaired children as they are non-directive, non-threatening and require no simple right answers and help identify feelings and desires especially for children who are not able express their emotions verbally.

## Dental Management Considerations in Sickle Cell Disease: A Case Report

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**Introduction:** The phenomenon of erythrocyte sickling observed in sickle cell disease is responsible for ischaemia and tissue infarction compromising several organs and systems including the mouth and face. It is a genetically derived disorder characterized by the presence of an abnormal hemoglobin molecule, designated as hemoglobin S (HbS). This report presents a case with sickle cell disease, challenges faced and the dental management protocols that were sequentially followed.

**Case report:** A 4-year-old male reported with carious lesions in all teeth except the lower anteriors, mucosal pallor, and a “smooth tongue”. An oral pantamograph revealed bone rarefaction and trabecular bone coarsening. Medical investigations that followed gave the final impression of sickle cell disease. Due to the recurrent splenic sequestration that followed, an emergency splenectomy was performed. Complete oral rehabilitation was however later completed after a series of medical considerations and precautions.

**Discussion:** Most dental procedures produce some form of bacteremia and thus the patient’s physician should be contacted before any proposed treatment. Infectious states as well as surgical procedures invariably will require antibiotic coverage. Preventive dental therapy is however the ideal approach for treatment of a sickle cell anemic patient. Treatment should never be initiated during a crisis unless in an emergency situation and should be designed only to decrease oral infection and discomfort.

**Conclusion:** Dental surgeons and physicians should be aware of the general and oral abnormalities that can be present in individuals with sickle cell disease to allow for preventive measures and implementation of effective treatment options.

**Dental Treatment of a Patient with DiGeorge Syndrome under General Anesthesia**

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**Introduction:** DiGeorge syndrome is a primary immunodeficiency disease caused by a segment deletion in the long arm of chromosome 22 at position 22q11.2 during early fetal development. The developmental defect leads to phenotypes including congenital cardiac anomalies, abnormal facial features, thymic hypoplasia, cleft palate, hypocalcemia, delayed behavioral and emotional development. In terms of oral manifestation, delayed eruption of permanent teeth, enamel hypoplasia, hypodontia, aberrant tooth shape, and dental caries are revealed. This report presents caries removal procedures performed on a patient with DiGeorge syndrome and suggests special care necessary for the patients.

**Case Report:** A 9-year-old boy with DiGeorge syndrome was referred to the Pediatric Department of Seoul National University Dental Hospital with the complaint of dental caries in both maxillary and mandibular molar. He had a history of receiving prosthetic heart valve surgery and cannula insertion operation due to tracheomalacia. He was also diagnosed with pulmonary hypertension and hypothyroidism. Due to the patient's condition and the severity of his dental caries, dental procedure under general anesthesia was planned.

**Discussion:** Dentists should be informed of the clinical characteristics of DiGeorge Syndrome. In particular, the reduction of stress level is crucial when treating patients with pulmonary hypertension. Thus, general anesthesia can be considered and prophylactic antibiotics should be required in the dental procedures to prevent infection.

**Conclusion:** DiGeorge syndrome patients need special care due to their delayed development and immunodeficiency. This case report suggests that dental procedure under general anesthesia is a safe method for DiGeorge syndrome patients.

Sedation, Special Needs Patients

### **Dental Treatment in Patients with Mitochondrial Encephalomyopathy with Lactic Acidosis and Stroke-like Episodes (Melas): A Case Report**

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**Introduction:** In patients with mitochondrial encephalomyopathy with lactic acidosis and stroke-like episodes (MELAS) whose aerobic metabolism is already compromised, anesthetic management should be designed to minimize stress on the metabolic system during dental treatment.

**Case report:** We report a 13-year-old girl with MELAS and history of epilepsy. The patient was taking benzodiazepine as an anti-epileptic drug (AED). The patient was scheduled for multiple dental caries treatments under general anesthesia. Pre-anesthesia examination results were normal. During general anesthesia, we used thiopental and rocuronium for induction, followed by desflurane for maintenance of anesthetic depth. We did not use sodium lactate containing solution for fluid management. After the operation, pyridostigmine was injected to reverse neuromuscular blockade. However, spontaneous breathing was not fully restored for 10 minutes. Additional sugammadex was injected and spontaneous respiration was completely restored. Moreover, a recovery from sedation was not achieved for 30 minutes after the operation. So, we injected flumazenil, and the patient recovered from sedation. The subsequent clinical course until discharge and periodic recall checks were uneventful.

**Discussion:** An increased sensitivity to rocuronium could be observed in some patients with MELAS, and the use of sugammadex could be an effective way to end the effects of rocuronium. Patients taking benzodiazepine as an AED could wake up more quickly from general anesthesia if administered flumazenil.

**Conclusion:** Dental treatment could be successful in a patient with MELAS under considerate general anesthesia.

### **Changing Lives with Prosthetic Eyes: Case Report of a Custom-Made Ocular Prosthesis for a 12-year old Patient**

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**Introduction:** ocular prosthesis is an artificial replacement of the eye. Apart from improving the facial aesthetics of the patient, it boosts the patient's self-confidence and improves quality of life. Since children are in their developing stages, loss of an eye can cause more psychological trauma and distress to them, thus, it is important to restore the facial aesthetics and symmetry of such patients at the earliest.

**Case report:** This case report presents the fabrication of a custom-made ocular prosthesis for a 12-year old boy who had undergone evisceration of the right eye. An acrylic custom tray was fabricated using an eye shell which the patient had already been wearing. Final impression was made using putty impression material. After shade matching with patient's left eye and performing try-in with wax pattern, final investment was done with heat cure acrylic resin using different colour tints to match patient's eye colour. Prosthesis was delivered after finishing and polishing.

**Discussion:** The custom-made eye prosthesis helped retain shape of defective socket, prevented collapse of lids, maintained palpebral opening, and gave a gaze similar to that of natural eye and hence, lead to improvement in physical, psychological and facial aesthetics. The technique used minimal equipment and was affordable for patient with a low socioeconomic status.

**Conclusion:** The technique described in this report represents a straight-forward, simple and cost-effective method. Although the patient cannot see by this prosthesis, this prosthesis will increase the self-confidence of the child to face the world.

### Infantile Hemangioma Dental Management and Impact on Oral Health

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**Introduction:** Infantile hemangiomas are the most common benign vascular tumors of infancy. They have a characteristic clinical course marked by early proliferation followed by spontaneous involution.

**Case report:** A five-year-old male patient who has developed infantile hemangioma at two weeks of age in the right side of his face, extending to the oral cavity. He is receiving laser therapy and taking propranolol, both treatment modalities have side effects of which pediatric dentists should be aware, as they have significant impact on oral health. The patient came to dental clinic complaining of dental pain due to recurrent dental caries. Dental history revealed that at the age of three years, the patient had completed full mouth rehabilitation under general anesthesia and didn't follow up to dental clinics after the treatment. At age five, we repeated the dental treatment under general anesthesia for the second time followed by 3-6 months recall appointments.

**Discussion:** The patient treatment is succeeded with marked improvement in the oral hygiene with no evidence of recurrent dental caries or periapical pathosis. Despite the benign nature and behaviour of hemangiomas in the head and neck region, they are of clinical importance to the dental profession and require appropriate clinical management.

**Conclusion:** It is important for pediatric dentists to know how to diagnose and manage patients with infantile hemangiomas. Impacts of hemangioma and its treatment options on the oral health have to be considered during dental treatment of a child for better and more successful outcomes.

**Neonatal Trismus : A Review**

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**Background:** Trismus in children can be either acquired which is due to infection, trauma and dental treatment or of congenital onset in which there is a restricted mouth opening present at birth. Intra-alveolar synechiae is the most common cause of congenital trismus.

**Literature Review:** Congenital trismus etiologies can be classified into syndromic and non- syndromic. Non syndromic entity is further divided into structural and non-structural variant. Syndromic congenital trismus include conditions like Crisponi syndrome, Trismus Pseudocamptodactyly, Multiple Pterygium syndrome, Pierre Robin Sequence . Non syndromic causes include Oral synechiae, Premasseteric bands, elongated coronoid process among structural causes and non structural cause include neonatal tetanus, misoprostal induced, hyperekplexia and congenital suprabulbar paresis

**Conclusion:** understanding the etiologies and differential diagnosis will help the clinicians in raising awareness regarding the potential causes of neonatal trismus and thereby planning appropriate management protocol to deal with airway compromise and feeding difficulty which will improve the quality of life of affected children.

## Special Needs Patients

**Oral Health of Visually Impaired and Sighted Children in a South Indian Population: A Comparative Study**

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**Background:** The estimated worldwide population of visually impaired is 285 million and among them 19 million are children. The oral health care remains one of the greatest unattended needs among them. The literature regarding the impact of visual impairment on oral health is limited. The aim of this study was to evaluate the oral health among institutionalized visually impaired children and compare it to that of institutionalized sighted children.

**Methods:** A cross-sectional study was carried out on 103 institutionalized visually impaired and 103 institutionalized sighted children. Two calibrated dentists performed the oral examination under adequate natural light using a disposable mouth mirror and CPI probe. The status of dental caries and dental trauma was measured according to the WHO criteria. The oral hygiene status was assessed using the Simplified Oral Hygiene Index of Green and Vermillon. The status of gingiva was assessed using the Gingival Index by Loe and Silness. The oral health related quality of life was assessed according to Jokovic et al.

**Results:** A statistically significant difference in mean scores of dental caries and oral hygiene was observed between visually impaired and sighted children ( $p < 0.05$ ). A weak to moderate negative correlation among visually impaired children and very weak to weak negative correlation among sighted children were observed between the scores of dental caries, oral hygiene and Oral Health Related Quality of Life scores, which was significant ( $p < 0.05$ ).

**Conclusions:** The visually impaired children exhibited suboptimal levels of oral health status when compared to sighted children.



## Special Needs Patients

**A Retrospective Analysis of Autistic Spectrum Disorder (ASD) Patient undergoing Comprehensive Dental Treatment under General Anaesthesia (GA)**

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**Background:** Delivering dental treatment to ASD patient in the clinic can be challenging. Due to their behaviour problem, many of the ASD patient require GA in order to manage their dental treatment needs. This study aimed to assess the utilization and the frequency of repeat GA among ASD patient that underwent comprehensive dental treatment (CDT) under GA at our hospital.

**Methods:** A total of 293 CDT under GA cases from January 2017 until March 2020 were obtained from the electronic dental hospital records. Of those, the demographic data, reasons for GA, type of dental treatment received and frequency of repeat GA among ASD patient were recorded and subjected to statistical analysis.

**Results:** 11% of the total patients that underwent CDT under GA were ASD patient (n=39), with the mean age of 8.5 years ( $\pm 4.19$ ). Dental caries was the main reason for GA (84.4%) followed by gingivitis (12.5%) and cellulitis (3.1%). Extraction (58.9%) was the most frequent dental treatment performed followed by preventive (20.6%), restorative (19.4%) and pulp therapy (1.1%). The frequency of repeat GA was 1% and no teeth require re-treatment following repeat GA.

**Conclusion:** The frequency of repeat GA among ASD patient was low. Dental caries was the main reason for GA where most of the carious teeth were extracted.

## Special Needs Patients

**“Mini Mouth Care Matters”: A Pilot Study at Bristol Royal Hospital for Children**

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**Background:** “Mini Mouth Care Matters” is a National initiative aimed to improve paediatric inpatient mouth care. A pilot study was carried out on the paediatric acute medicine ward at Bristol Royal Hospital for Children. The aims of the study were to review the current procedures for documenting mouth care, to assess how a hospital stay impacts on patients level of mouth care, to gain understanding of mouth care product availability and to collect information regarding nurse’s experiences and attitudes towards training and practices in mouth care.

**Methods:** Data collection methods included patient and nursing staff questionnaires, a medical record review and a product questionnaire. The sample included 20 inpatients, 10 patient records and 10 nurses.

**Results:** Of the inpatients assessed, none had a record of mouth care assessment, 50% had oral health products available during their hospital stay, 70% who could not independently brush had their teeth brushed by a parent or appropriately trained staff and 40% felt their oral health was worse while they were in hospital. Of the nursing staff interviewed, 70% had not received any mouth care training and 80% felt they would benefit from mouth care training.

**Conclusion:** This describes a pilot on one ward of a national initiative. Lack of action on mouth care can lead to increased infections and increased length of hospital stays. Staff currently lack confidence to “lift the lip” to assess oral health. Teaching sessions and implementation of oral health assessment tools have been planned for the coming months.

## Special Needs Patients

**Effectiveness of Visual Pedagogy and Video Modelling in Training Toothbrushing Skill in Children with Autism Spectrum Disorder**

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**Background:** Oral hygiene of children with Autism Spectrum Disorder(ASD) is poorer than their normal peers because neither they possess the necessary manual dexterity for toothbrushing nor do they comprehend its importance. To improve their oral hygiene status, it is mandatory to improve their brushing skill. Being visual learners, visual pedagogy(VP) and video modelling(VM) are effectively used in training self-help skills. The purpose of this study was to evaluate the effectiveness of visual pedagogy and video modelling in teaching the brushing skills for children with ASD.

**Methods:** In this open label trial, 36 children belonging to moderate category of ASD, aged 7-15years received VP and VM. Parents were trained on the usage of visual pedagogy (an album of 15 pictures demonstrating the sequential steps of brushing) at home daily while the child is brushing. VM is a 3-minute-video demonstrating the same to be played at school once daily by teachers. Plaque & Gingival indices(PI & GI) were recorded at baseline, at the end of 1st, 2nd & 3rd months of intervention which were evaluated using repeated measures ANOVA. Parents filled perception forms based on their children's improvement in toothbrushing habits at the end of 3 months was presented as percentages.

**Results:** A significant effect of intervention on reduction in GI, Wilks' Lamda=0.24, F (3, 29)=30.69, p0.01,  $\eta^2=0.76$  was observed; pairwise difference was significant between baseline and 3rd month (p 0.026). There was a significant effect of intervention on reduction on PI, Wilks' Lamda=0.36, F (3, 29)=16.92, p0.01,  $\eta^2=0.63$ ; where observation at all three months were significantly lower than baseline (p 0.011, 0.015, 0.024 respectively). According to parent's perception, 13(40%) parents observed improvement in their child's brushing skill.

**Conclusion:** The significant decrease in objective scores over time, suggest that VP & VM are effective tools in teaching brushing skills to children with ASD.

## Special Needs Patients

**Dental Treatment of a Boy with Special Needs at Undergraduate Level: A Case Report**Carla Madrid<sup>1</sup>, Jenny López<sup>1</sup>, Paula Laurent<sup>1</sup>, Daniel Carreño<sup>1,2</sup><sup>1</sup>*School of Dentistry, Faculty of Medicine, Pontificia Universidad Católica de Chile, Santiago, Metropolitan Region, Chile*<sup>2</sup>*Dental Service, Pedro Aguirre Cerda Rehabilitation National Institute, Santiago, Metropolitan Region, Chile*

**Introduction:** Children with special health care needs may present different conditions as systemic diseases and disabilities. They may develop oral problems which could be related to their medical status, which can be exacerbated due to barriers that impede dental treatment, such as the lack of appropriately trained dentists.

The purpose of this report is to present the experience of three students who, under direct supervision, delivered dental treatment to a child with special needs, considering a biopsychosocial approach.

**Case report:** A 13 year-old boy attended the Dental Clinic, School of Dentistry, Pontificia Universidad Católica de Chile. Medical diagnosis included learning disability and epilepsy. The main challenges to provide dental treatment were identifying the best ways to communicate with him and behaviour management. To achieve this, students made an in-depth investigation about different methods to approach, establishing a confidence relationship. When performing the intraoral examination, traumatic ulcers associated to toothbrushing were detected, therefore an individualized oral hygiene program was developed.

**Discussion:** Some authors report that special needs children face various barriers regarding dental care. Others report that dental students exposed to the care of these patients at undergraduate level may develop an empathetic attitude which encourages them to treat them during their professional life. However, it is uncommon among Dental Schools to teach how to provide dental treatment to these patients.

**Conclusion:** It is highly recommended that dental students are trained on the provision of treatment of special needs children, reducing access barriers and favouring their wellbeing.

### Phonoarticulación in Patients with Down Syndrome

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**Background:** Articulation disorders are present in 95% of children with Down Syndrome (DS), stemming from incorrect coordination and anatomical and physiological differences. Furthermore, 40 - 80% have decreased hearing, affecting language development and, therefore, their quality of life. The health team must recognize, on time, possible variants.

**Methods:** An article research was carried out during the year 2019, through the databases PubMed, Cochrane Library and EBSCO; scientific journals and retrograde search, using MeSH terms and keywords "Down Syndrome", "Speech", "trisomy 21", "speech disorders", "phonetic", and "children", connected by Boolean terms "AND" and "OR". Articles were considered without language or year restrictions; however, those carried out in the adult population or associated with other pathologies were excluded.

**Results:** 7 articles were selected from a total of 1,260, all of them in English. 100% stated that children with DS have articulation disorders, describing unfavorable characteristics such as muscle hypotonia, hearing loss, and lack of articulatory movement coordination. Speech disorders' origins are multiple, and not only the result of a cognitive disability. The most frequent are the lack of intelligibility, errors when pronouncing consonants and apraxia.

**Conclusions:** The management of pediatric patients with DS requires multidisciplinary work, especially with speech therapy. Dentists can identify maxillofacial and pharyngeal characteristics, promptly refer and participate in the multidisciplinary care team. Regarding the possible extrapolation of results, no Spanish-speaking articles are presented, so they do not apply to populations with such language.

## Special Needs Patients

**Dental Management of Patient with Rett Syndrome under General Anesthesia in a Child: A Case Report**

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**Introduction:** Rett syndrome (RS) is a progressive neurological disorder characterized by arrested development of the brain. This X chromosome-linked disorder affects females almost exclusively with an incidence of 1 in 10,000 – 15,000. The disorder is caused by mutations in MECP2 gene, encoding methyl-CpG-binding protein 2. The classical features of RS including developmental stagnation, altered communicative ability, stereotypical hand movements, seizures, and breathing abnormalities appeared after a period of relative normality in infancy.

**Case Report:** A 9-year-old girl with RS visited Seoul National University Dental Hospital Department of pediatric dentistry for caries treatment. Clinical and radiographic examinations revealed multiple carious lesions. Based on patient's underlying disease, dental treatment under general anesthesia was scheduled. Considering patient age, extent of caries, all the remained deciduous teeth except mandibular second molar were extracted. All the permanent first molars were restored with adult stainless-steel crowns.

**Discussion:** In this report, point mutation on MECP2 gene was observed in 9-year-old girl, diagnosed as a RS. The most common oral findings of this syndrome include digit sucking, bruxism, drooling, tongue thrusting, high prevalence of gingivitis, low caries prevalence and high prevalence of anterior open bite. In this case, patient showed bruxism, multiple caries, anterior crossbite, anterior deep bite. In patients with RS, the incidence of oral diseases is high due to the difficulty in dental care and special attention is required.

**Conclusion:** In this case study, we present dental treatment case of 9-year-old girl with RS under general anesthesia. Earlier dental treatments and preventive measures including dental prophylaxis, application of topical fluoride are recommended for patients with RS.

**New Digital Techniques for Remote Dental Care in Patients with Neurological Disorders**

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**Introduction:** As a result of the pandemic, the need to modify dental practices has been a priority, due to the high risk of contagion of SARS-CoV2. The physical attention has been reduced and new measures have been chosen to maintain the oral health of our patients.

In the case of special needs patients, there is a high rate of comorbidities that increase the risk of serious complications if they are infected by COVID-19, which make their attendance and their follow-up at the consultation more difficult.

New methods for monitoring oral health have recently emerged, such as “Tele-odontology”. This consists of remote evaluation either by phone or digital media such as videos, applications, etc. that will help diagnose, provide therapeutic guidance, follow-up or indicate the need for in-person assistance.

**Case Report:** A 13 year-old patient diagnosed with Dysgenesis of the Corpus Callosum. The patient had no cooperation, high cariogenic risk and generalized gingivitis. She was in follow-up since 2016, and a great improvement of her oral condition was observed during the last controls in 2018. Giving this, has been decided, together with her parents, to implement tele-odontology to continue with long distance support, prevention and treatment.

**Discussion:** As dentists we have had to use new strategies such as digital media, allowing us to reach patients in a closer and efficient way, by using educational audiovisual materials, in order to promote their oral health.

**Conclusion:** For the success of tele-odontology it is essential to have the commitment of families and or caregivers, who must help carry out the indications given by the specialist.

## **A Novel One Stage Impression Technique used for Fabrication of Single Visit Feeding appliances for Cleft Palate Infants**

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**Introduction:** Feeding plate for cleft palate (CP) infant is not only critical for proper nutrition, but also it has a role in craniofacial growth and reduces nasopharyngeal infections incidences as well. Intraoral impression making is a critical clinical step in the fabrication of feeding appliance. The aim of this report is to compare two different impression techniques used for construction of single visit feeding appliances for CP infants.

**Case report:** A case series of six cleft palate infants "mean age 99 days, two males and four females" in need of feeding appliances were enrolled in our report. Using block randomization, all enrolled participants were randomly allocated in two main groups. Group A(n=3), two stage impression technique; Group B(n=3), a novel one stage technique using modelling was as an impression material. The outcomes were assessed regarding both the clinical applicability in terms of assessment of the details produced in the cast and its liability to be used successfully for fabrication of a feeding appliance and the feeding efficiency in terms of weight gain after 4 weeks.

**Discussion:** The models produced by both techniques that were investigated by a blind investigator can be used successfully for fabrication of a feeding appliance without a major difference. Also, comparing the weight of children before and after using the appliance with the WHO growth standard they show an increase in weight but still underweight in relation to their age group.

**Conclusion:** Under the limitations of this study, one stage impression technique using modelling wax in construction of a single visit feeding appliance can be used successfully in comparison to multi-stage impression technique regarding the clinical applicability and feeding efficiency.



### Oral Microbiota and Autistic Spectrum Disorder: Key points from Current Literature

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**Background:** Autism Spectrum Disorder (ASD) is a neurodevelopmental disturbance which manifests in the early years of life and is characterised by behavioural and social impairments as well as restricted interests and repetitive behaviours. The etiology of ASD involves genetic and environmental factors but recent studies show that oral and gut microbiome play a part too.

**Literature Review:** Our search protocol included a search strategy, inclusion/exclusion criteria and a data extraction plan. The search engines used were PubMed, Scopus and ScienceDirect. Manuscript selection was performed independently by two reviewers. Articles published from 1980 to 2019 were reviewed based on inclusion and exclusion criteria.

Studies suggest a mouth-brain axis where there is transfer of bacteria from the oral cavity to the brain because of repetitive behaviour, resistance to oral hygiene and altered dietary preferences exhibited by patients suffering from ASD. Some bacteria such as Clostridium and Actinomyces produce metabolic alterations and inflammation which may lead to development of ASD. Gastro-intestinal (GI) symptoms such as constipation, diarrhoea and abdominal pain were more prevalent in children with ASD. Changes in gut microbiota composition because of lower bacterial diversity in the oral cavity suggests a correlation between oral microbiota and ASD.

**Conclusion:** Identifying certain bacteria and their metabolites can control or modify some GI symptoms affecting children with ASD. These microbiota affect the neurodevelopment and certain signs and symptoms of ASD. This suggests a potential role of oral microbiota as a diagnostic biomarker.

**Paediatric Obstructive Sleep Apnoea: Time to Wake Up**

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**Background:** Sleep is undoubtedly one of the most essential requirements for the human body to function properly. Humans spend one-third of their lives sleeping, so it is not surprising that the topic of sleep has aroused the intellectual curiosity of philosophers, scientists, and physicians since ancient times. By the age of two, most children have spent more time asleep than awake and overall, a child will spend 40 per cent of his or her childhood asleep. Sleep is especially important for children as it directly impacts mental and physical development.

**Literature Review:** Sleep disordered breathing (SDB) can cause significant health problems that are associated with a high morbidity and high risk of mortality. Paediatric obstructive sleep apnoea is disorder of breathing during sleep, which is characterised by prolonged partial upper airway obstruction or intermittent complete obstruction that disrupts ventilation during sleep and fragments sleep patterns. In children, hypertrophy of the tonsils and adenoids are the most common risk factors for SDB in children, followed by obesity.

**Conclusions:** There is high demand for the care of children with sleep-related breathing disorders; a great shortage of health care providers to provide diagnoses and treat these children, and recommends an interdisciplinary approach that includes dentistry in conjunction with myriad medical and healthcare domains, In providing collaborative patient-centered care. Given the high prevalence of POSA in children, we advocate that all dentists become familiar with screening tools, diagnosis, and treatment of this disorder.

## Special Needs Patients

**Dental Rehabilitation in a Child with Rare Platelet Disorder (Glanzmann's Thrombasthenia): A Case Report**

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**Introduction:** Glanzmann's thrombasthenia (GT)- a rare, autosomal recessive disorder, presents with quantitative and/or qualitative platelet abnormalities. With global incidence of 1 in 1,000,000, it is characterized by increased bleeding time, normal platelet count and morphology with an abnormal platelet functional assay. Patients usually present with excessive bleeding associated with trauma or surgery leading to life-threatening complications. Here, we present a case report of full-mouth rehabilitation of a 4-year old with GT under general anaesthesia.

**Case Report:** A 4-year old boy with GT reported with severe pain in posterior teeth and inability to eat. Examination revealed multiple deep carious lesions in molars, presence of spontaneous bleeding in gingiva and few petechiae. Patient was advised complete hemogram, prothrombin time, renal function tests and chest X-ray. Reports revealed iron deficiency anaemia and INR 1. Due to high risk of bleeding and uncooperative behaviour of child, rehabilitation under general anaesthesia was planned. Pulp therapies, restorations, crowns and fluoride application were performed as indicated.

**Discussion:** GT shows faulty sealing of blood vessels and increased bleeding. Pulp extirpation, extractions may lead to significant bleeding which can be difficult to control. To avoid complications, multidisciplinary approach was necessitated. Following which, platelet transfusions-gold standard treatment for bleeding in GT, were done before surgery and comprehensive dental management was completed uneventfully.

**Conclusion:** This case is rare example of full-mouth restorative rehabilitation of a child with GT. The key to successful dental management of such special children involves multidisciplinary team approach with paediatric haematologist, anaesthetist, paediatrician and paediatric dentist.

## Special Needs Patients

**Association of Intelligence Quotient (IQ) and Body Mass Index (BMI) with Dental Caries and Gingivitis in Intellectually Disabled Children**

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**Background:** Gingival and dental diseases prevail in the populations worldwide, despite significant improvements in the oral health awareness. Prpić et al. have correlated that individuals with high BMI show poor oral hygiene. Similar findings have been noted in individuals with lower Intelligence Quotient as well. In addition to this, Intelligence Quotient is also affected by BMI. This study highlights the associations between Intelligence Quotient, BMI, dental caries and gingivitis in intellectually disabled children.

**Methods:** A total of 200 intellectually disabled children between the age group of 6 to 12 years were subjected to a Sequine Form Board test, to calculate Intelligence quotient (IQ). Their BMI was calculated using weight/height<sup>2</sup>. The evaluation of status of dental caries and gingival inflammation was done using decayed missing filled Teeth (DMFT) / dmft index and Loe and Sillness Gingival index respectively.

**Results:** The assessment of this study shows that IQ does not display a statistical co-relation with dental caries and gingivitis. Whereas, BMI does not show any co-relation with decayed and missing teeth but display significant statistical co-relation with filled teeth and gingival status of intellectually disabled children.

**Conclusion:** The Body Mass Index can be used to associate the Filled teeth and Gingival status of Intellectually disabled children.

**Oral Rehabilitation of Patient with Di-George Syndrome Under General Anesthesia**Elif Kardes, Peris Celikel, Sera Simsek Derelioglu*Department of Pediatric Dentistry, Ataturk University Faculty of Dentistry, Erzurum, Turkey*

**Introduction:** Di-George syndrome is a disease caused by the deletion of a small segment of chromosome 22. Characteristic signs and symptoms include birth defects like congenital heart disease, palate defects, learning disabilities, mild differences in facial features, and recurrent infections. The mandible is hypoplastic (micrognathia). Enamel aberrations related to hypocalcemia may result in a higher frequency of dental caries, and in some cases hypodontia is detected.

**Case Report:** 6-year-old male patient diagnosed with Di-George syndrome administered to our clinic with the complaints of teeth pain and recurrent dental infections. The patient had walking difficulties, mental and developmental retardation. In clinical and radiographic examination, it was observed that tooth number 46 was erupting, and caries had progressed to pulp in all primary teeth. After the necessary consultations were obtained the patient was taken to general anesthesia. Fissure sealant was applied to 46. All the primary teeth were extracted.

**Discussion:** Considering the reasons such as the patient's mental retardation, the family's inadequate care in the patient's oral care, poor oral hygiene and socioeconomic status, poor retentive tooth structure for the restoration of the teeth, risk of aspirating the restoration or the SSC in a possible decementation, and not leaving a tooth that may be a possible source of infection in Di-George syndrome patients with weak immune system, it was decided that the extraction of all primary teeth would be more appropriate in this case.

**Conclusion:** In syndromic patients with mental retardation, acting radically in the treatments performed under general anesthesia may be needed. For this reason, attention to oral care becomes more important, and teeth should be protected from caries as much as possible with regular dentist controls.

**Minor Physical Anomalies in Children with Sickle Cell Disease: A Case-Control Observational Study**

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**Background:** Minor physical anomalies (MPAs) are morphological variations which are usually painless and harmless owing to adverse genetic and environmental factors and includes palatal rugae pattern and its dimensions. Sickle cell disease (HbSS) is the homologous condition in which polymerisation of Hb-S causes fragility and sickled shape haemoglobin under altered conditions leading to developmental disorders as well as delayed growth. The purpose of this research work was to study palatal rugae and its dimensions in children with SCD.

**Methods:** The primary alginate impressions were obtained from 50 children aged 10-18 years with SCD (study group) and 50 normal healthy children (control). Casts were poured in dental stone and palatal rugae and palatal dimensions were imprinted, examined and recorded. Data was statistically analysed using SPSS software 22.0 version.

**Results:** A total of 993 palatal rugae were observed, out of which 460 and 530 were in the study and control group, respectively. However, the fragmentary rugae were significantly lower in the study group. The height and centre of the palatal arch were also significantly lower in the study group. Although, no statistical difference was found for the width of the palatal arch among the groups.

**Conclusions:** Lesser number of fragmentary rugae, lower height and centre of the palatal arch were inferred in children with SCD might be related to delayed growth in patients with sickle cell disease which in turn delays vertical facial growth. These peculiar MPAs could serve as an early identification tool for the detection of SCD from the clinical perspective.

### **Effects of Chemotherapy on Oral Hygiene Status and Salivary Parameters in Children with Acute Lymphoblastic Leukemia**

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**Background:** Chemotherapy exerts its effects on rapidly proliferating cells, thereby affecting cells such as those of oral mucous membrane and salivary glands in addition to malignant cells. This may entail adverse effects on the oral cavity. The purpose of the present study was to study the effect of chemotherapy for Acute Lymphoblastic Leukemia on oral hygiene status and salivary parameters during different phases of chemotherapy.

**Methods:** This prospective observational study was done on 43 children, aged 3-12 years. Salivary flow rate, pH and buffering capacity, gingival and plaque index scores, severity of mucositis and Absolute Neutrophil Count (ANC) were recorded at baseline, at the end of induction phase and at the end of consolidation phase. The subjects were evaluated prior to, at the end of induction and at the end of consolidation phase of chemotherapy.

**Results:** The evaluated parameters showed worsening during the course of chemotherapy, with maximum decrease at the end of induction phase and a subsequent improvement at the end of consolidation phase. A significant direct correlation was found between ANC and salivary flow rate, pH and buffering capacity. At an ANC below 1500/mm<sup>3</sup> (neutropenia), there was a statistically significant decrease in unstimulated salivary flow rate (p0.05), pH (p0.001) and buffering capacity (p0.001).

**Conclusion:** A significant decrease in salivary parameters during chemotherapy, especially during episodes of chemotherapy-induced neutropenia suggests a breach in the local defence mechanism of the oral cavity along with systemically compromised immunity in children undergoing antineoplastic treatment.

**Help them Grow: A Case Report of a CLP Infant**

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**Introduction:** A child born with cleft lip and palate may experience difficulties while feeding. The changes in nasal shape occur because the defect extends through the floor of the nostril. The upper portion of the nostril must straddle the cleft, resulting in flattening of the nasal tip and downward displacement of the outside portion of the nostril. Obtaining a good seal of the oral cavity is difficult due to the incomplete facial and palatal structures. The oro-nasal communication diminishes the ability to create negative pressure for sucking. Till that time a feeding obturator is indicated to maintain the oral functions of the infant. This paper presents management of a child with unilateral cleft palate and lip extending up to the nasal region.

**Case report:** An infant aged 2 months was referred by the paediatrician for dental management of the cleft palate and lip. The infant was moderately nourished and extra oral examination, unilateral cleft palate and lip extending to the nostril on left side was seen.

After discussion with family members and oral surgeons, it was decided to fabricate a feeding appliance with modification for Naso-Alveolar Molding(NAM). An impression was made and acrylic plate was fabricated. It is held into position in the baby's mouth and skin tape applied to the cheeks. Mother was instructed in insertion and taping.

**Discussion:** Nasoalveolar molding (NAM) was introduced to improve the results of cleft lip repair without additional surgery. NAM harnesses the growth of the gums and facial bones to narrow the gap in the gums. As the width of the gap in the gums is reduced, the space between the middle and side parts of the lip and nose move closer to a normal position.

**Conclusion:** The specialized feeding appliance helps in better nutrition and NAM will reduce the severity of deformation of soft tissues.



## Glanzmann Thrombosthenia: A Case Report

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**Introduction:** Glanzmann Thrombosthenia (GT) is a rare platelet disorder affecting 0.0001% of the population. Dentists may often be unaware of this condition and manipulation of soft tissue can lead to grave consequences which may even result in fatality. This case report highlights the importance of medical history and warrants a thorough knowledge about management of bleeding disorders.

**Case report:** A four-year-old male patient reported to the Department with a chief complaint of a discoloured anterior tooth. The mother gave a history of a self-fall that the child had 3 months ago. The episode of fall was associated with bleeding from the maxillary anterior region which did not stop for 10 minutes. On eliciting medical history, the parents reported episodes of prolonged bleeding following minor trauma and hematemesis since the age of one. Patient was diagnosed with Glanzmann Thrombosthenia at the age of three. Intra oral examination showed a full complement of primary teeth. 51 was discoloured suggestive of a non-vital tooth.

**Discussion:** The Pediatric Dentist plays a pivotal role in the diagnosis of this condition. As they are usually the first to see children at a young age. Spontaneous mucosal bleeding, petechiae, purpura or ecchymosis in the mucosa, excessive bleeding following tooth extraction, gingival bleeding during teething or shedding of teeth are suggestive of an underlying bleeding disorder.

**Conclusion:** Early diagnosis and prompt treatment carry good prognosis though this GT does not have a cure. It is imperative to begin with preventive therapy by educating the patient to maintain good oral hygiene.

## Special Needs Patients

**Oral Rehabilitation of a Patient with a History of Henoch Schonlein Purpura: Case Report**

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**Introduction:** Henoch-Schönlein purpura (HSP) is a self-limiting vasculitis characterized by palpable purpura, joint, abdominal or renal involvement, the prognosis is good in the absence of renal compromise, urinary studies are recommended annually and blood pressure monitoring. Affected children are very susceptible to periapical infections from severe caries, as well as periodontal disease. The purpose of the report is to present oral treatment in a patient with a history of HSP.

**Case report:** A 7-year-old male patient with a history of Henoch-Schönlein purpura attended a consultation in the pediatric dental department due to pain in the right upper first temporal molar. Clinically, chronic periapical abscesses were observed in 54, 64, 74, and 84. For treatment, request a consultation with the pediatrician, who performed the corresponding examinations to verify the patient's health and authorize oral care on a regular basis.

In each session, blood pressure is required, obtaining normal values that allowed anesthetic blocking with lidocaine 1: 100,000 and 2% epinephrine at 4.4 mg per kilogram of weight, to perform pulpectomy treatments (vitapex) and placement of steel crowns - chromium in the affected organs.

**Discussion:** prophylactic premedication was not recommended due to being in a healthy state. After a year and a half of follow-up, no signs of general and local infection were observed.

**Conclusion:** This report found that interdisciplinary treatment achieved the patient's dental health regularly and safely.

### Study of the Secretomics of *Filifactor alocis* Bacteria Isolated from Saliva of Kidney Transplanted Adolescents

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**Introduction:** Secretomics is the technique that quantitatively analyzes metabolites secreted by microorganisms present in biofluids and / or tissues. These molecules have variable molecular weight and, according to their physicochemical properties, can have considerable impacts on the systemic profile of transplanted individuals. Several studies have shown the importance of oral homeostasis in this population, since the course of chronic kidney disease (CKD) can be affected by the products of the metabolism of the oral microbiota.

**Methods:** Fifteen adolescents and young adults, 12-18 years old, who received kidney transplant, registered at CAPE (Center for special needs patients) at the Faculty of Dentistry and the Children's Institute of the Faculty of Medicine - Universidade de São Paulo (USP), were part of this study. All participants received information prior to the collection of saliva. Periodontal analysis was performed using the simplified oral hygiene index (OHI-S), bleeding on probing and probing depth. Saliva samples were collected and stored at -80 ° C until analysis. The microorganism *Filifactor alocis* was isolated, its growth kinetics was monitored, the samples collected and analyzed at the Dempster Mass Lab of the Chemical Engineering Department of the Polytechnic School of USP using the gas chromatography technique coupled to the mass spectrometer (GC-MS) . Statistical analyzes were performed using principal component analysis (PCA) and Mann-Whitney tests.

**Results:** The relative quantification of metabolites secreted by this microorganism showed higher statistically significant concentrations of amino acids ((arginine (p 0.0001), glycine (p 0.0001), cysteine (p 0.0002)), fatty acids ((hippuric acid (p 0.0001) ), glucuronic acid (p 0.0002), indoleacetic acid (p 0.0310)) and carbohydrates ((fructose (p 0.0001), galactose (p 0.0001), glucose (p 0.0001), maltose (p 0.0001)).

**Conclusion:** It was concluded that kidney transplant patients, especially when presenting periodontal disease can develop oxidative stress, which in the presence of microorganisms such as *Filifactor alocis*, favours the endogenous production of metabolites that are potentially aggressive to the periodontium and the transplanted organ.

## Special Needs Patients

**Fear, Anxiety, Behavioral and Guidance Techniques During Preventive Care in Children with and without Down Syndrome: Cross-Sectional Study**

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**Background:** Although Down syndrome is considered the most common chromosomal anomaly, there is little research on the behavior and the most commonly used behavioral guidance techniques during dental care of children. Thus, the aim of this study was to evaluate child's fear and anxiety, behavior and guidance techniques used in children without and with Down syndrome during preventive dental care.

**Methods:** Cross-sectional study. Forty children between 24 and 71 months of age were divided into two groups: 20 children with and 20 children without Down syndrome. Fear and anxiety was evaluated by vital signs (heart rate) and behavior was evaluated by three methods: the dentist's subjective evaluation, Melamed's Modified Behavioral Scale and Frankl's Behavior Scale during five moments of preventive appointment: in the waiting room, recounting of medical history, positioning in the chair, preventive procedure and end of the preventive procedure. The behavioral guidance techniques applied were evaluated by direct observation. Friedman and Mann-Whitney U tests and Spearman's Correlation Coefficient were applied ( $p < 0.05$ ).

**Results:** There was a statistically significant difference for heart rate during recounting of medical history ( $p = 0.0166$ ) and preventive procedures ( $p = 0.0009$ ) with the highest values for children with Down syndrome and negative correlation between heart rate and age during recounting of medical history ( $p = 0.016$ ), positioning ( $p = 0.018$ ), performing ( $p = 0.027$ ) and end of preventive procedures ( $p = 0.017$ ).

**Conclusions:** The fear and anxiety were more elevated in children with Down syndrome in three different moments during preventive appointment and the behavioral guidance techniques employed were similar.

### The Evaluation of Swallowing Disorders' Effects On Maxillofacial Structures in Children with or without Cerebral Palsy

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**Background:** Cerebral Palsy (CP) is the most common and well-known neuro-developmental disorder that appears in childhood. Swallowing disorder is one of the most significant orofacial disorders in children with CP even though the children without CP can also be affected. In this study we aimed to evaluate the effects of swallowing disorder on orofacial structure of children with CP and without CP comparatively.

**Methods:** The study population was involve 53 children with CP and 50 children without CP between 2-6 years old. The children's oral motor functions including swallowing disorders mouth breathing, tongue thrust, macroglossia, lip closure, tongue posture, severity and frequency of the flow of saliva, swallowing, chewing and eating related functions were evaluated according to scale of Oreland. Data were analyzed by SPSS statistical software, version 20.0. The Chi square and T test wereused to examine the orofacial functions of children with CP and children without CP.

**Results:** As a result of comparison between the two groups; a significant difference was determined in terms of chewing( $p=0,017$ )and swallowing function( $p=0,014$ ), drooling frequency( $p=0,000$ )and severity( $p=0,000$ ), mouth breathing( $p=0,000$ ), lip closure( $p=0,000$ ), macroglossia ( $p=0,000$ ), wear of canine and molar teeth, gingival hyperplasia, tongue thrust ( $p=0,000$ )and position ( $p=0,017$ ). On the other hand, there is no significant difference in consumed food type ( $p=0,056$ ). A reverse relation was found between lip closure and drooling frequency ( $p=0,000$ ), severity ( $p=0,000$ ).

**Conclusions:** The results of this study indicate that swallowing disorder occurred as a result of cerebral palsy.. Early diagnosis and treatment of swallowing disorder is important to improve the life quality in cerebral palsied children.

### Castillo-Morales Therapy in Down Syndrome: Case Report

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**Introduction:** Down syndrome is characterized by distinctive anatomical aspects, including the orofacial region, namely tongue dimension/posture, changes in the perioral musculature, lips and masticatory complex, along with other physiological changes with direct impact on sucking, swallowing, speech, occlusion and even social interaction. Early intervention using the Castillo-Morales palatal plate (original or modified), combined with orofacial therapy, seems to contribute to significantly improve these functions, preventing their tendency to worsen with the general growth of these children.

**Case report:** Clinical intervention included use of a modified Castillo-Morales palatal plate in a 12-month-old male with Down syndrome. Details regarding its planning, laboratory preparation, placement, adaptation, use, cessation and monitoring period are fully described and illustrated.

**Discussion:** The main purpose of this intervention is obtaining lingual retraction, lip stimulation movements, improvement of hypotonia, and , oral cavity closure. Children`s receptivity is described as relatively simple and natural, particularly if they already wear a pacifier, since it serves as an adaptive basis. The potential benefits of the plate are enhanced by its use at a very early ages, positive influencing the development of neuromuscular structures and conditioning decisive reflex mechanisms in a more harmonious facial development.

**Conclusion:** Notwithstanding the results, it should be recognized that this treatment is not a complete and transversal solution for all children, but rather an additional measure in the orofacial stimulation approach by a multidisciplinary team.

**Sickle cell Anemia and Turner's Tooth Hypoplasia : A Case Report**

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**Introduction:** Sickle cell anemia (SCA) is an inherited disorder of hemoglobin synthesis, and the most common genetic disease in the world. It is characterized by recurrent attacks of pain, frequent bacterial infections and shortened life expectancy. SCA frequently exhibits multisystemic manifestations including oral disorders. Turner's hypoplasia, is a term used to describe a permanent tooth with a hypoplastic defect. This case report describes the dental care protocol for a child with SCA.

**Case report:** A 10-year-old male child was referred to the Dental Care for Special Patients Clinic at the Ribeirão Preto Dental School, University of São Paulo. Medical history revealed that he is a patient with SCA. His main complaint was pain in a lower tooth. The patient reported the extraction of primary tooth 75 due to early caries. In the intra-oral clinical examination, the tooth 35 showed type IV enamel hypoplasia, caries, yellowish discoloration, fistula and percussion pain. Radiographically, revealed diffuse structure and inadequate root formation. After medical consultation, the treatment plan included antibiotic therapy with amoxicillin 1 hour before tooth extraction 35 and later a space maintainer. In the postoperative, the healing was satisfactory.

**Discussion:** The dental surgeon must be aware of the need to eliminate oral sources of infection and immediate treatment of acute infections in patients with SCA to prevent medical complications.

**Conclusion:** The oral infections are considered a high risk factor in the precipitation of a sickle cell crisis. Antibiotic prophylaxis is recommended prior to any clinical procedures that may result in bleeding

Endodontics, Special Needs Patients

### **Multiple Endodontic Treatments in a Patient with Intellectual Disability: A Case Report With 12 Months of Follow-Up**

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**Introduction:** The objective was to report a case of multiple endodontic treatments with hybrid instrumentation and non-pharmacological management of behavior in patients with disabilities.

**Case report:** PBN, male, melanoderma, 17 years old, diagnosed with intellectual disability and asymptomatic epilepsy, attended the FOUFRJ Disabled Patients Clinic for review. Teeth 11, 21 and 22 had an uncomplicated enamel / dentin fracture resulting from trauma. The radiographic examination showed radiolucent images suggestive of a periapical lesion in the 3 teeth. In multiple sessions, the Say-Show-Do technique was used, infiltrative anesthesia, absolute isolation, endodontic and restorative treatment. After initial exploration and determination of dentistry (file type k # 10) with apical locator, manual instrumentation (files k # 55 - # 80) and reciprocating (Wave One Gold Large file) were performed, with irrigation of sodium hypochlorite 2, 5% and EDTA 17%. Gutta-percha cones anchored at the working length cemented with Endofill and then condensed were used for filling. Teeth 11 and 22 were restored with composite resin and 21, rehabilitated with fiberglass pin and direct resin veneer.

**Discussion:** Clinical and radiographic follow-up showed: within 6 months, reduction of radiographically periapical lesions; and, at 12 months, 100% of clinical and radiographic success.

**Conclusion:** It was concluded that periodic consultations in patients with intellectual disabilities, with individualized behavior management, allow the execution of successful endodontic treatments.



### Decoronation Treatment of Pediatric Patients with Special Health Care Needs

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**Introduction:** The special health care needs include any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity.

Health care for individuals with special needs requires specialized knowledge, in many cases, without the need for sedation or general anesthesia.

In these patients the risk of dentoalveolar trauma is high with various consequences for permanent dentition

**Case Report:** An 11-year-old boy with special health care needs who had a complicated crown fracture of his two permanent upper incisors (1.1 and 2.1). Endodontic treatment of 1.1 and decoronation of 2.1 were performed with a provisional in cantilever. This treatment was performed under laryngeal mask.

**Discussion:** The decoronation of a resorbing anterior tooth will allow it to serve as a matrix for alveolar bone formation and preserve an otherwise resorbing alveolar process, thereby leaving an environment of bone and soft tissue that is optimal for both single implant insertion or fixed prosthesis. Finally, decoronation, if indicated, appears to be cost-effective in comparison with non-replantation combined with subsequent repeated prosthetic tooth replacements owing to vertical alveolar growth of adjacent ridge areas.

**Conclusion:** Good management of dental trauma in special health care need patients can be performed in all patients with a good multidisciplinary team.

**Influence of Anticonvulsant Drugs on Oral Health: Case Report**

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**Introduction:** Cerebral palsy is the commonest physical disability in children, caused by a non-progressive injury to the developing brain. This population may present with multiple comorbidities, being the epilepsy one of the most prevalent. Within the oral adverse effects associated to anticonvulsants, it has been reported the presence of gingival enlargement.

The purpose of this report is to highlight the importance of considering the influence on oral condition from anticonvulsant drugs, especially that of valproic acid.

**Case report:** An 11-year-old boy attended the Dental Clinic at Pedro Aguirre Cerda National Rehabilitation Institute. Medical history includes spastic cerebral palsy and West syndrome. Pharmacological treatment involves diazepam, clonazepam, carbamazepine, primidone and valproic acid. Intraoral examination revealed mixed dentition, biofilm – associated gingivitis and generalized gingival enlargement which affected the eruption of permanent dentition.

**Discussion:** Phenytoin is the most commonly anticonvulsant drug associated with gingival enlargement, which may be detected up to 50% of patients who receive it.

A study reported that patients under anticonvulsant polytherapy will not necessarily develop a gingival enlargement, however none of the subjects they evaluated did receive valproic acid. Other study observed a greater presence of gingival enlargement in a child population with epilepsy and medicated with valproic acid, concluding that the longer the patient is under anticonvulsant therapy, the greater the probability of developing gingival enlargement, as it was found in this case.

**Conclusion:** Further studies are required to assess whether valproic acid may be related to gingival enlargement, determining involved physiological mechanisms.

### Access Barriers for Home Dental Care: Case Report

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**Introduction:** in 2018 Recoleta began the home dental care(HDC) for patients with severe dependency(PDS).In 2019 was adopted nationally. The HDC-PDS allows to avoid some of those access barriers. This case report is mentioned to show the geographical and architectural barriers for the HDC. The legal guardian consented this publication.

**Case Report:** MMU patient, woman, 24 years old, with spastic cerebral palsy. hers attending were in her commune`s clinic, but her father had to carried her and then use the wheelchair to be transported. because her house location. In 2019 this case was researched, and referred to PDS. After visit her is possible to confirm the access barriers such as, street on hill(steep slope) long distance steps(150 meters) narrow dirt track passages(20 meters). she lives with her father and her couple. both works. She has a poor verbal communication but understands and tries to collaborate. Despite of good preliminary view. she needed nutritional and dental care(great harm accumulated). To attend here was necessary to bring the mobile equipment and was very hard to move because the weigh(30kg) and big size of it.

**Discussion:** A good dental health of patients with specials needs and PDS is very important for their daily bases and ensures better quality of life for them. The geographical and architectural barriers are a major obstacle for the HDC.

**Conclusion:** Is very important to consider to adapt the HDC to every patients' conditions, to overcome the geographical and architectural barriers and give proper support and ensure their quality life.

**Geographical and Architectural Barriers for Home Dental Care in Recoleta, Chile**

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**Background:** In Chile, the 16,75% of the population between 2 years old and more are in a disability situation. Currently, in Recoleta commune, the 1,22% have a disability condition. In response of their dental care needs, in 2018 we develop the House Dental Care (HDC) for patients with a severe dependency. Some studies have shown the existence of geographical and architectural barriers for the HDC, which hinder the planning process, the transport of dental equipment and proper physical conditions for the professionals.

**Methods:** Transversal and descriptive study. The Recoleta`s digital platform, RAYEN 2020 data base from Chile, was used. All enrollees in dependency situation from the commune`s health centers were included according to Barthel index. A classification on dependency degree and residence neighborhood unit (UV) was carried out. Hard access was considered 8 of 35 UV (house on hill, flats without elevator, narrow passages). The data were analyzed using descriptive statistics and t-student.

**Results:** 1187 individuals with a dependence condition live in Recoleta. 23,5% in full dependency and 15,33 in severe dependency. After the place of residence data analysis, 12,58% live in hard access lands.

**Conclusions:** In Recoleta`s commune exists geographical and architectural barriers for the HDC, which are a big challenge for the dental team, because requires additional planning and logistics to attend the scheme`s beneficiaries.

## Special Needs Patients

**Assisted Breastfeeding Technique to Improve the Knowledge, Attitude and Practices Mothers of Infants Affected with Cleft Lip and Palate**

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**Background:** Cleft lip and palate is one of the most common developmental anomalies affecting the craniofacial region leading to an array of problems including the inability to feed properly. This study aimed to compare the effectiveness of specially designed Audio-Visual modules over traditional instructional modules in improving the assisted breastfeeding habits.

**Methods:** 16 patients received training regarding the feeding practices through the traditional Instructional method and 16 subjects received training through Audio Visual Module. Infants in both the groups received the standard care. These infants were followed up longitudinally for 6 months. During the follow up period the growth parameters were recorded monthly. The knowledge, attitude and practices of the mothers regarding feeding practices were assessed using a KAP questionnaire.

**Results:** There was significant improvement in the knowledge of the mothers from baseline to 6 months however the practices indicated that the mothers belonging to the AudioVisual Module group showed better understating of the condition and earlier adaptation of the breastfeeding practices. Correspondingly the growth parameters also showed significant differences.

**Conclusion:** The Custom made Audio Visual Module would help the mothers adapt better to the stressful situation following the birth of the infant affected with cleft lip and palate.

## Special Needs Patients

**Dental Care of a Patient with Serious Psychiatric Disorders Associated with Dependence Syndrome**

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**Introduction:** The consumption of illicit drugs is frequent nowadays. In Brazil it has become a public health problem, affecting adolescents and young adults, with a strong social and economic impact on families and health systems. Illicit drugs users can suffer depressive stimulant and hallucinogenic effects, carious lesions with pigmentation, burns, xerostomia, candidiasis, tooth erosion wear and periodontal disease.

**Case report:** We present a 44-year-old female patient who received dental care at the clinic for patients with special needs at the Dental Teaching Hospital of the School of Dentistry, UFRGS. The patient presented dependency syndrome, bipolar affective disorder (TABP), episodes of severe depression with psychotic symptoms and schizoaffective disorders of depressive type (TE) due to the use of crack. That condition generated a high incidence of dental caries, actinic cheilitis and xerostomia. The behavioral management of the patient was very difficult. Minimally invasive restorations, tooth extractions and a provisional lower removable partial denture were performed.

**Discussion:** The damage that drugs cause in the oral cavity is numerous, related to neglected oral hygiene by drug users and, due to compulsive consumption of a cariogenic diet. The treatment proposed contemplated prosthetic rehabilitation, to improve her quality of life.

**Conclusion:** The present report showed oral and behavioral characteristics of a patient in accordance to the literature for people with severe psychiatric disorders and crack users. The dentist plays a key role in the rehabilitation and wellbeing of patients with these conditions and must be prepared to work with the family support network of these patients.

## Special Needs Patients

**Lange Cornelia Syndrome in a Child Associated with Riga Fede Ulcer: Case Report**

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**Introduction:** Cornelia de Lange (CdLs) is a rare syndrome with multisystemic manifestations characterized by deficiency development, commitment growth, abnormalities in multiple organs (including changes in the hands and feet, renal and cardiovascular malformations and changes in neurological development) and, typical facial dysmorphism. Frequent dental problems that include the presence of a deep and pointed palate, micrognathia, delayed eruption, dental erosion, periodontal disease and self-mutilation of the tongue.

**Case Report:** The objective of this study was to report the case of a 2-year-old and 4-month-old female patient from the dental clinic for patients with special needs at the Dental Teaching Hospital of the Federal University of Rio Grande do Sul (UFRGS), with Cornelia de Lange Syndrome, who presented a traumatic lesion in the lingual belly known as Riga Fede ulcer, associated with teeth that were born at birth.

**Discussion:** The identification of the knowledge of the comorbidities that a patient with Cornelia de Lange Syndrome has, is of fundamental importance for the good handling and management of a clinical case and more, the professional must have knowledge of the changes that occur in the patient`s oral cavity with this syndrome and also to know about the possible pathological lesions commonly associated (Riga-Fede lesion).

**Conclusion:** In the referred clinical case, the removal of the lesion resulted in improvements in the patient`s diet, irritability and quality of life.

## Salivary C-reactive Protein and Secretory Immunoglobulin A in Children with Chronic Liver Disease and Liver Transplantation

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**Background:** The salivary C-reactive protein (CRP) is a biomarker of the acute phase of inflammation in response to infections related to periodontal diseases. The secretory immunoglobulin A (SIgA) has an important function in protecting the teeth by reducing the initial microbial adhesion on the enamel's surface and also neutralizes bacterial enzymes. The aim of this study was to analyze the CRP and SIgA of saliva from children with chronic liver disease and liver transplantation, attended in the Pediatric Gastroenterology and Transplantation Ambulatory, Federal University of Sao Paulo, Unifesp/Epm, Brazil.

**Methods:** controlled cross-sectional study involving 59 children, both of genders, with primary dentition, being 28 with chronic liver disease and no liver transplantation, 11 with liver transplantation and 20 constituting the control group. Samples of unstimulated whole saliva were collected by aspiration method and the CRP and SIgA were quantified using a sandwich enzyme-linked immunosorbent assay (ELISA). The Kruskal-Wallis complemented by Dunn statistical tests were utilized for data treatment regarding significant difference if  $p < 0.05$ .

**Results:** there were not significant statistically differences in the mean SIgA ( $\mu\text{g/mL}$ ) between chronic liver disease ( $46.05 \pm 31.20$ ), liver transplantation group ( $34.95 \pm 16.87$ ) and control group ( $35.90 \pm 12.06$ ). The other CRP analysis did reveal significant differences in the mean CRP ( $\text{pg/mL}$ ) between liver transplantation ( $6996.29 \pm 11052.14$ ) and control group ( $1162.87 \pm 2006.17$ ).

**Conclusion:** therefore, the increase of C-reactive protein in children with liver transplantation may suggest a possible periodontal disease increment.



## Special Needs Patients

**Pediatric Dental Treatment under General Anesthesia: 44 years of Experience in a Cross-sectional Study**

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**Background:** Behavioral management is important for a safe pediatric dentistry treatment. So, general anesthesia (GA) could be an alternative for effective treatment for special needs patients (SNP). This study aimed to compare GA pediatric dentistry treatments between healthy children (HC) and SNP in the Pediatric Dentistry area of State University of Londrina (PD/UEL).

**Methods:** This cross-sectional study analysed GA records of PD/UEL SNP and HC from 1974 to 2018. Data was analyzed according to: gender, age, HC or SNP, GA indication and procedures performed. Chi-square test was used for data distribution and frequency (P0.05).

**Results:** From 731 medical records analyzed, 371 (50.8%) were SNP and 360 (49.2%) were HC (P0,05). The most frequent indication was the extension and complexity of the treatment and non-collaborative behavior, for SNP it was 71.1% and it was 43.9% for HC (P 0.001). The highest frequency of GA treatment was for age groups below 3 years in HC and above 7 years in SCN (P 0.001). In SNP, tooth extraction and sealant were more frequent than in HC (P 0.001). In HC, the use of a steel crown and the endodontic treatment were more frequent than in SNP (P 0.001).

**Conclusions:** The GA in pediatric dentistry could be considered an alternative for more complex dental treatment and behavior management at ages over 7 years in SNP and under 3 years in HC.

**Management of a three-year-old patient with Anhidrotic Ectodermal Dysplasia: A Case Report**

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**Introduction:** Ectodermal dysplasia is an inherited disorder in which two or more structures from ectodermal origin (ie. hair, nails, sweat glands) fail to develop or develop abnormally. Lack of development of one or more teeth poses a challenge when it comes to restoring function and aesthetics.

**Case report:** The parents of a three-year-old boy sought treatment for him at the Tygerberg Oral Health Centre in Cape Town, South Africa. He was diagnosed with anhidrotic ectodermal dysplasia at the age of two years. Due to the absence of teeth, the child was having difficulty eating. His parents were concerned about the psychological effect constant teasing from other children would have on their son especially since he would be starting school soon.

Extra-orally the child presented with some defining characteristics of this disorder namely, sparse hair, absent eyebrows and eyelashes, dry skin, frontal bossing and loss of vertical dimension. Intra-orally, the patient was partially edentulous. Only the 53, 51, 61, 63 were clinically present and conical in shape. Treatment objectives were to improve function and aesthetics and restore the vertical dimension.

**Discussion:** Clinical management involved reshaping anterior teeth with composite and construction of an upper and lower denture. The patient adapted well to the dentures in terms of function and speech. The mother mentioned that he smiled a lot more and his confidence increased dramatically. The lower denture had to be relined a few months later to improve the fit.

**Conclusion:** The treatment objectives of improved function, aesthetics and self-esteem were successfully achieved.

## Recurrent Trauma and Follow-up Affecting Upper Maxillary Teeth in a Child with Cerebral Palsy: A Case Report

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**Introduction:** Cerebral palsy (CP) is characterized by motor dysfunctions that may be associated with sensory or cognitive impairment stemming from a non-progressive brain lesion. Individuals with CP have a high risk of dental trauma because of their typical Class II malocclusion.

**Case report:** A 10-year-old girl patient with CP, presented to our clinic as a result of trauma in the maxillary central teeth (#11 and #21) after falling. It was observed that a complicated crown fracture was in #11 and an enamel-dentine fracture in #21, close to the pulp. Cvek pulpotomy was applied to #21 with white MTA while root-canal treatment was applied for #11 that has completed root development. It was observed that teeth were healthy in their 3-month and 1-year follow-up. In a 18-month follow-up as a result of recurrence of the trauma it was observed that both restorations were broken. #11 was healthy while #21 had periapical lesions. Following the root-canal treatment applied to #21, both restorations were renewed. However, while it was observed that the teeth that were controlled with the repetition of the trauma within 1-year were observed to be periapically healthy, the restorations with impaired margins were renewed.

**Discussion:** Studies have shown that patients with CP have a higher risk of dental trauma than healthy individuals, although their physical activity is limited.

**Conclusion:** Individuals responsible for the care of patients with CP should be aware of the dental trauma risk in terms of oral health and be careful.

**Autism Spectrum Disorder: Don't Label but Enable**

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**Background:** Autism Spectrum Disorders encompass a range of neurodevelopmental conditions. These individuals experience difficulties with social interaction and exhibit restricted, repetitive patterns of behaviour, interests, or activities. Due to these symptoms, it is conceivable that lack of responses to demonstrations and inability to establish personal contacts with the personnel may obscure professional oral care proceedings.

**Literature review:** Nelson LP et al in 2005 said that aversion to dental treatment, complications associated with the medical condition, and difficulties in locating a practitioner willing to provide care have been reported by guardians of children with Autism.

Barbaresi WJ et al in 2006 suggested that knowledge and in-depth understanding of basic behavioural patterns is salient in successfully coping with a child with ASD at the dental office, such as the lack of curiosity for the environment and incapability of the child to share information using spoken language, gestures and eye contact.

According to a review by Delli et al in 2013, four main behaviour management approaches were suggested for Autistic children, them being visual pedagogy, providing a sensory adapted environment, applied behaviour analysis and advanced behaviour guidance methods.

**Conclusions:** The dental management of a child with ASD requires in-depth understanding of the autistic behavioural profile. Based on well-established behavioural guidance techniques, the therapeutic approach should be individualised for each patient. The role of continuous education of dental professionals and parents is essential in overcoming the difficulties encountered by the autistic child in the dental chair.

Epidemiology, Oral Medicine and Pathology, Special Needs Patients

### **The Care of the Children at Risk at the Dental Consultation and Treatment Center of Casablanca in Morocco: Parents Satisfaction Survey**

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**Background:** Dentists in pedodontics encounter a huge number of children with systemic conditions. The relationship between oral health and general health is close and well known now. Parent`s satisfaction is a significant indicator in the care results. Such an approach is part of a quality process allowing to target the changes to be made in order to optimize the care in the service of pedodontics. The study aims to rate the parental satisfaction of children at risk according to the care provided to them in the service of pedodontics in Casablanca

**Methods:** this cross-sectional epidemiological survey was conducted on 212 children at risk. This study was made up by patients followed up withing the pediatric dentistry service in Casablanca for 3 months. Parents were asked to complete a questionnaire during each visit that dealt with the different dimensions of satisfaction.

**Results:** according to this study it appears that: 76% of the parents thought that the treatment received were appropriate, 90% of the parents will definitively recommend the service of pedodontics to other people and parents were more aware of the service around the care (delay of appointment, kindness..) than the dental treatment itself.

**Conclusion:** Several studies have been conducted showing the satisfaction of the care provided in a dental center. The measured satisfaction does not make sense. It should rather generate feedback improving the treatment performance of the health facilities.

### **Dirofilariasis of the Buccal Mucosa: A Rare Entity**

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**Introduction:** Human dirofilariasis is a zoonotic infection caused by the genus *Dirofilariasis*. In India, *D. repens* is found to be the most common pathogen causing human subcutaneous dirofilariasis resulting in a granulomatous nodule.

**Case report:** A 5-year old child patient presented with the complaint of a swelling of 2 weeks duration in the right side cheek. History was unremarkable and on clinical examination, a diffuse swelling with no significant signs and symptoms was seen. Laboratory investigations and radiographs were non-contributory to the diagnosis. The presence of a *Dirofilaria* worm in the excised nodule confirmed the diagnosis.

**Discussion:** *Dirofilariasis* is an endemic disease in certain parts of Africa, Asia, Europe, and America. Most of them live in the subcutaneous tissues of their hosts. Occasional transmission of *Dirofilaria* larvae to man occurs via the mosquito vector. *Dirofilariasis* of the oral cavity is extremely rare, but when present, is usually seen in the buccal mucosa as sub mucosal nodules. The definitive recommended treatment is surgical removal of the worm to be followed by anthelmintic treatment.

**Conclusion:** Cases of intra-oral nematodes often pose a diagnostic dilemma leading to improper management. Medical awareness of the risk of intra-oral nematode infection is essential. A detailed travel history, awareness of the endemic status of certain diseases, proper diagnosis, and management aids in a better prognosis for the patient.

## Effectiveness of Picture Book and Sign Language Video as Educational Tools on Oral Hygiene Status of Children with Hearing Impairment

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**Background:** Any child with emotional, physical, mental, sensorial, developmental, behavioral, and cognitive problems or medical conditions falls under the children with special health care needs category. Literature suggests that due to the existence of one or more disabilities, many unmet dental problems, particularly periodontal problems, are faced by this group of individuals. Therefore, a preventive dentistry program was planned with the aim to evaluate customized video- and picture books as oral health education tools on the oral hygiene status of children with hearing impairment (CHI).

**Methods:** 120 CHI, within the age group of 6-13 years, were divided into 2 educational intervention groups: customized oral health educational video (group A) and picture book (group B). A structured questionnaire was designed to gather information about the routine oral hygiene practices via the Indian Sign Language. Baseline GI-S and PI-S indices were recorded. Based on the group assigned, oral hygiene instructions were given daily. Reassessment was done after 30 days.

**Results:** Post-intervention PI-S scores between group A and group B were  $0.12 \pm 0.22$  and  $0.13 \pm 0.23$  respectively and the difference was statistically insignificant ( $p=0.28$ ). For GI-S, score in group A and group B were  $0.03 \pm 0.12$  and  $0.04 \pm 0.15$  respectively and the difference was statistically insignificant ( $p=0.34$ ).

**Conclusion:** Both authenticated picture book and video modelling have proven to be effective in enhancing the oral hygiene of CHI especially during this COVID-19 pandemic, wherein social distancing norms make it difficult to address any student cohort in a group, such as in a classroom.

## Oral Health Education Strategies for Biofilm Control in Children with Autism Spectrum Disorder: A Case Report

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**Introduction:** Although there are no oral health disorders specific for children with Autism Spectrum Disorder (ASD), poor oral hygiene and impaired sensory perception have been described for these patients. This clinical case reports on oral health education strategies for biofilm control in a child with an Autism Spectrum Disorder.

**Case report:** A 9 year-old boy with ASD presented with caries lesions and difficulties with oral hygiene practices. Intraoral dental examination revealed the massive presence of biofilm, a high decayed, missing and filled teeth (DMFT) score, and moderate gingivitis. A comprehensive educational strategy for the child included supervised training of brushing with an adapted toothbrush, picture exchange communication system, positive reinforcement, and for the parents, motivational interviewing, teach-back, and ask-tell-ask. The improvement of the simplified oral hygiene indexes and the gingival bleeding index demonstrated the success of the intervention. The appointments gradually boosted communication skills between child and dentist.

**Discussion:** ASD can be challenging for the dentist and the child's parents. In this case, the child's oral self-care behavior was the key element to the development of a strategic plan for managing a child with ASD.

**Conclusion:** This case report showed that a comprehensive educational strategy can be implemented in a child with Autism Spectrum Disorder to improve oral health hygiene and interaction among dentist, parents, and child.



**Special Child Management during COVID-19 Pandemic**

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**Background:** The recent outbreak of coronavirus disease 2019 (COVID-19) caused by the emerging severe acute respiratory syndrome coronavirus 2 (SARS-cov-2) and the declaration of pandemic by the World Health Organization have made an enormous impact on medical and dental care across the world.

**Literature Reviews:** Arkadiusz Dziedzic et al (2020)The “3R” principle, Redefinition, Reconsideration and Reflections, addresses well these challenges in the dental sector, recommending clinicians to demonstrate a professional commitment and be ‘slicker and quicker’, displaying critical decision-making skills.

In the field of special care dentistry, even basic advice may have a huge impact on clinical outcome. A patient with acute/chronic oral medicine problems would vastly benefit from professional recommendations, provided over the phone, regarding treatment planning. It is vitally important to reassure our patients, encouraging them to continue taking their prescribed medications, as any sudden change in pharmacotherapy regimen may have a detrimental effect on patients’ outcome. Preparation seems to be another key word for special dental care ‘evolution’ in the nearest future.

**Conclusions:** The current COVID-19 situation may teach dental teams a better approach and optimal ways concerning the management of patients with special needs, by bringing people together to discuss and optimize standards of care, as often happens in challenging situations. We can always learn new things that turn out to be valuable and useful even in exceptionally difficult times, and in addition, dental services can benefit from enabling positive attitudes and introducing constructive changes.

**Chair Side General Anaesthesia: A Boon to Pediatric Dentist**

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**Introduction:** Behavior management plays a major role in success of dental treatment in pediatric patients. In routine dental practice we encounter children with varieties of behavioral problems. Some children may not cooperate as they are too young and some may have certain medical conditions which prevent them from obtaining dental treatment. Even though non-pharmacological means of behavior management has proved to be effective tool in managing the uncooperative children, its use is limited in medically compromised children. Dental sedation and general anesthesia are the treatment options in such cases.

**Case reports:** This paper describes two cases of early childhood caries which were treated under general anesthesia due to their high non-cooperative chair side behavior. In both cases it was definitely negative behavior according to Frankel's rating scale. Complete oral rehabilitation was done which included restorations, fluoride application and extraction of grossly decayed teeth that had a poor prognosis. Ten days after procedure both children were recalled and oral hygiene status was assessed. Removable functional space maintainers were given and oral hygiene instructions were reinforced

**Discussion:** Careful selection of cases is out most important for success of general anesthesia cases. We need to work in collaboration with pediatrics and anesthesia personnel to get clearance for the treatment to avoid any untoward complications.

**Conclusion:** General anesthesia is a safe mode of treatment for disabled children who require emergency dental care.

## Special Needs Patients

**Assessment of Oro-Facial Dysfunction (OFD) among Children with Neurodevelopmental Disorders and its Association with Dental Caries & Brushing Behaviour**

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**Background:** Nordic Orofacial Test-Screening (NOT-S) is a comprehensive screening method of OFD which consists of a structured interview and clinical examination. The aim of the study was to evaluate the orofacial dysfunctions among children with neurodevelopmental disorders using NOT-S and to find out the association of OFD with dental caries and brushing behaviour.

**Methods:** Thirty-six children aged 4-12 years with neurodevelopmental disorders were included in the study group and age matched 36 healthy children were randomly selected for the control group. Two trained and calibrated examiners who were experienced on NOT-S interview and examination performed screening and interpreted the results. Clinical data for caries detection was collected based on the criteria developed by WHO (1997) and brushing behaviour was assessed based on a customized questionnaire.

**Results:** NOT-S interview and clinical examination subscale scores of children with cerebral palsy were higher and found to be statistically significant. The most common dysfunctions were in the chewing and swallowing area followed by sensory function area. Chewing and swallowing function, sensory function, oral motor function and masticatory muscle with jaw function appeared to have an association with dental caries and brushing behaviour.

**Conclusions:** NOT-S protocol was an effective and valuable tool for the comprehensive screening of orofacial dysfunctions among children with neurodevelopmental disorders, it assisted in relating OFD to children's brushing behaviour and prevalence of dental caries.

## Special Needs Patients

**Comparative Evaluation of Problematic Eating and its Association with Dental Caries Among Children with Special Needs and Healthy Children**

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**Background:** The aim of this study was to determine the prevalence of problematic eating and its association with dental caries among 4-12 year-old children with special needs (Cerebral Palsy, Autism Spectrum Disorders) and healthy children in Bengaluru city, India.

**Methods:** All the selected 36 children were clinically examined for dental caries using decayed, missing, filled surfaces index. Children's eating behaviour was assessed using Children's Eating Behaviour Questionnaire (CEBQ) which was filled by the parents. Statistical Analysis used: Both descriptive statistics as well as Chi-square test was used.

**Results:** The prevalence of dental caries was found to be more among autistic children than children with cerebral palsy or healthy children, though not statistically significant. Few from both the study groups of children had a tendency of food pouching. Emotional overeating and food responsiveness was more in autism. Selective food preferences was seen more in cerebral palsy. Prevalence of dental caries was more in children who ate more when they had nothing else to do, and in those who had food preferences.

**Conclusions:** Problematic eating behaviour was prevalent among children with cerebral palsy and autism than in healthy children.

## Special Needs Patients

**Dental Management of Children with Special Healthcare Needs Under General Anaesthesia: A Retrospective Study**

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**Background:** Children with special health care needs (CSHCN) are a vulnerable population group who have an increased risk of developing caries due to the poor oral hygiene, the high sugar contents in their medications, regular consumption of cariogenic foods and a poor salivary flow. The aim of this retrospective study is to evaluate the dental treatments of CSHCN performed under general anaesthesia in Akdeniz University, Faculty of Dentistry, Department of Paediatric Dentistry in the West Mediterranean region of Turkey.

**Methods:** The archive of the department has been searched and the data of CSHCN were collected from the years 2013 to 2020.

**Results:** A total of 236 CSHCN received dental treatment under general anesthesia, 60,5 % were male and the mean age was 8,9 (2-21 age). ASA 2 was identified in generally of patients according to ASA classification. Fissure sealant application were made 10% of patients and fluoride varnish was applied to all patients. Restorative treatments were performed with 49.5% composite filling, 49.6% compomer filling, 0.8% glass ionomer cement. Teeth extracted were performed for 78% permanent teeth, 31% primary teeth. Periodontal treatment was performed in 18%. Average operation time was 90 minutes.

**Conclusions:** Prevention strategies and restorative treatments are important to maintenance of oral health in CSHCN in order to improve their quality of life.

**Oral Management of Children with Cerebral Palsy: Two Case Reports**

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**Introduction:** Cerebral palsy (CP) is a disorder of movement and posture caused by a defect or injury in an immature brain. In general, the prevalence of CP varies between 2 and 2.5 per 1,000 births. Several orofacial disorders can accompany this disorder namely gastroesophageal reflux, risk of suffocation, drooling. The most common oral manifestations are malocclusions, high dental decay risk, susceptibility to dental trauma, periodontal disease as well as bruxism.

**Case report:** 2 young patients with CP, one is 8 years old and the other 4 years old, have consulted for dental decay. The dental care was preceded by a psychological approach associated to sedative premedication.

**Discussion:** The oral management of CP patients requires a good behavioral approach, conditioning before treatment (sedative premedication, patient positioning, use of a mouth prop and powerful suction) and rigorous oral follow-up.

**Conclusion:** The purpose of this presentation is to illustrate, through two clinical cases, the various operational difficulties encountered in the dental care of a child with cerebral palsy.

## Special Needs Patients

**Profile of Dental Procedures Performed Between 2008 and 2018 at a Dental Special Care Center in Brazil**

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**Background:** Patients with special care needs may present with conditions that facilitate the development of oral diseases. There are few epidemiological surveys investigating these patients' profiles with their respective treatment needs. This study aimed to carry out a retrospective analysis of ten-year dental records of patients with special care needs treated at the Human Resources Training Center for Patients with Special Care Needs (CAOPE) at the School of Dentistry of Ribeirão Preto, University of São Paulo, Brazil.

**Methods:** This study consisted of analyzing a database of patients treated at CAOPE from 2008 to 2018, regarding gender information, number of dental appointments and treatments performed. Data were tabulated in Microsoft Excel® spreadsheets and analyzed descriptively.

**Results:** A total of 4,185 patients were attended at CAOPE, with a total of 18,016 appointments and 83,206 procedures performed, including topical fluoride applications, applications of pit and fissure sealants, composite resin restorations, endodontic treatment and tooth extraction. The results revealed a decrease in tooth extraction and an increase in preventive and conservative procedures at CAOPE overtime.

**Conclusion:** These findings may contribute to the implementation and planning of interventional health actions, aiming to optimize care and promoting oral health in this population. Moreover, epidemiological studies are of fundamental importance to better understand and facilitate future approaches in these patients' oral health care.

## Special Needs Patients

**Bruxism in Children and Adolescents with Intellectual Disabilities: A Scoping Review**

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**Background:** Children and adolescents with intellectual disabilities may have a high prevalence of awake bruxism (AB) and/or sleep bruxism (BS). The study aimed to evaluate the prevalence of bruxism and the most indicated treatments, and associated factors, through a scoping review.

**Methods:** Medline (via Pubmed), Scopus, Lilacs, Web of Science, and Grey Literature were screened. Cross-sectional studies, cohorts, case-control, randomized controlled clinical, case series, and case reports that provided information on the prevalence and treatment of, as well as the factors associated with, bruxism in children and adolescents with intellectual disabilities were included. The data was tabulated and analyzed descriptively, then synthesized.

**Results:** 150 articles were selected, and after reading the titles and abstracts, 16 were included. Of these, 8 were cross-sectional, and 8 were case reports. The prevalence of bruxism ranged from 17% to 67.4%. The most frequent factor related to bruxism was tooth wear, while malocclusion, temporomandibular dysfunction, mouth breathing, sucking habits, tongue posture, and periodontal/gingival lesions had varied frequencies. The most appropriate treatment for bruxism was the preparation of occlusal acrylic devices; however, there was no consensus in the type of model, nor in the arch for installation.

**Conclusion:** The prevalence of bruxism in patients with intellectual disabilities is high, but lacks more scientific evidence in the literature regarding the best form of treatment to minimize the signs and symptoms of this condition.



# ***Syndromes and Genetics***

**Oral Rehabilitation in a Patient with Jeune Syndrome Presenting with Multiple teeth Agenesis**

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**Introduction:** Jeune syndrome (JS) is a rare disease, with systemic manifestations, such as renal and hepatic insufficiency, retinal pigmentation, and respiratory insufficiency. Etiological factors have not been completely elucidated, but the molecular biology has contributed to the diagnosis and understanding of Jeune syndrome (JS) with DNA sequencing, showing the association among polymorphisms in different genes DYNC2H1 (MIM 603297) and TCTEX1D2 (MIM617353) are the main genes associated with JS. There are a few reports on buccal findings in these patients, here, we present dental anomalies and clinical oral findings in a patient with JS, focusing on a multidisciplinary approach for rehabilitation.

**Case report:** A 15-year-old boy with JS was referred to our dental clinic. Clinical and radiographic examination revealed the presence of dental agenesis, taurodontism, and geographic tongue with lobulations. The treatment plan consisted of preventive, restorative, surgical, and oral rehabilitation.

**Discussion:** We reported a clinical case of JS with oral findings not reported previously. We described teeth agenesis and taurodontism as possible oral phenotypic characteristics of JS. Furthermore, we presented a dental approach for a person who, although young, exceeded the life expectancy of most cases reported in the literature.

**Conclusion:** Rehabilitating function and esthetics promotes a better quality of life owing to improved masticatory function, esthetics, maintenance of oral health, and above all, helps the patient with inter-human relations and improves their self-esteem.

**Association between Sella Turcica Bridging and Impacted Maxillary Canines**

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**Background:** Changes in sella turcica (ST) development may be associated with the impaction of the permanent canine teeth. The aim of this study was to evaluate if there is an association between ST bridging and the presence of impacted maxillary canines (IMC).

**Methods:** In this case-control study, two blindly and calibrated examiners, through cephalometric radiographs, measured the length, diameter and depth of the ST, and levels of calcification were established. Sixty-four patients were divided into a case group - with IMC (n = 32), and a control group - without IMC (n = 32). Comparison of ST dimensions between groups was carried out by t test, whereas the association of ST bridging with the case group was analyzed by chi-square test. The strength of the association between ST bridging and the case group was estimated by the odds ratio.

**Results:** The case group have a shorter ST length (P = 0.042), which is reduced in males (P = 0.038). ST bridging frequency is higher in case group (P = 0.03) and gender does not have an influence. The odds ratio of having ST bridging between cases was 5.92 times higher than in the control group.

**Conclusions:** It can be concluded that patients with IMC have shorter interclinoidal distance, which is reduced in males. ST bridging can be considered as a diagnostic tool to evaluate canine impaction.

**A Long-term Follow-up Case of Brothers with Compound Mutations-related Hypophosphatasia**

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**Introduction:** Hypophosphatasia (HPP) is a rare inherited skeletal disease caused by defects in tissue-nonspecific alkaline phosphatase.

**Case report:** Two brothers (11 years, and 7 years and 8 months old) were referred to our dental clinic by a paediatrician for consultation regarding malocclusion. The younger brother had limb curvature and was diagnosed with perinatal benign-type HPP at birth. Both patients had been diagnosed with growth hormone deficiency, so they were administered a growth hormone at the referral hospital. They possessed compound mutations p.F327L and c.1559delT, revealed by subsequent genetic testing. No early exfoliation of the primary teeth was observed. At around age 13, the younger brother was diagnosed with periodontitis associated with HPP. His dental care has continued at our department every two to four weeks for over 14 years from the first visit. Although alveolar bone resorption and mobility of teeth were observed, no significant progress has been observed in recent years due to the maintenance of plaque control. The elder brother has shown no symptoms of periodontitis.

**Discussion:** The factors determining the severity of HPP and appearance of dental symptoms remain unclear. In this case, both brothers have the same gene compound mutations, but HPP symptoms occurred only in the younger brother.

**Conclusion:** Although not applied in these cases, in general, enzyme replacement therapy has led to improvement in the prognosis of patients with HPP. In the future, this therapy could also be applied to treat dental symptoms and contribute to the improvement of QOL of children with HPP.

**Dental Arch Morphology: Does Genetics Play a Role?**

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**Background:** A genetic and environmental factor plays an important role in the occlusal variations and malocclusion and has been a major focus of interest to orthodontist. Research among twin pairs is one of the most effective methods available for investigating genetically determined occlusal variables. Many studies have concentrated on the distances between first molars or between canines but malocclusions can also occur in other regions of the dental arch. Hence the aim was to assess the occlusion and dental arch measurements among twin pairs.

**Methods:** A random sample of 51 twin pairs aged 12–16 years participated in this study. The zygosity of twin pairs was recorded by facial appearance. Occlusion of the first permanent molars was recorded according to Angle's classification. The study models were prepared for measuring dental arch parameters (arch form, arch perimeter, arch length, inter canine and inter molar width). The data collected was subjected to statistical analysis.

**Results:** Almost 89% of monozygotic and 95% of dizygotic twins had Class I molar relationship. Ovoid was the most common dental arch form seen (81% and 91% in monozygotic and dizygotic twins, respectively). The measurements of arch perimeter, arch length, inter canine and inter molar width were found to show no statistically significant difference among twin pairs.

**Conclusion:** There were similar occurrences of the measured parameters among twins showing a genetic predominance over environmental factors in the expression of measured traits.

**Rare Genetic Disorder: Rabson-Mendenhall Syndrome**

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**Introduction:** Rabson-Mendenhall Syndrome is a rare genetic disorder with mutation of insulin receptor gene and insulin resistant diabetes mellitus. It is characterized by growth retardation, facial dysmorphism, skin abnormalities, precocious puberty and dental anomalies. The available literature on dental manifestation is scarce. We herein present a rare case of Rabson-Mendenhall Syndrome highlighting the general features and oral manifestations.

**Case Report:** A 12-year-old girl diagnosed with Rabson-Mendenhall Syndrome presented to us for dental consultation. On physical examination, the girl was found to have dense hair with low hairline, acanthosis nigricans, hypertrichosis and thick fingernails. Intra-oral examination revealed multiple dental manifestations of the syndrome including macrodontia, crowding and enamel defects. Clinical and radiographic examination were carried out and a multidisciplinary approach was planned for the dental management.

**Discussion:** The physical characteristic of the syndrome is explained in comparison to the available literature. Dental manifestations and the implications are discussed. The management of this syndrome requires coordinated efforts of a team of specialists.

**Conclusion:** Rabson-Mendenhall Syndrome is a rare genetic disorder that can be clinically identified based on the characteristic physical features and metabolic derangements. Awareness among dental practitioners about the syndrome and its oral manifestation can facilitate in providing optimal dental care for these children.

**Dental Characteristics of Microcephalic Osteodysplastic Primordial Dwarfism Type II**

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**Background:** Microcephalic osteodysplastic primordial dwarfism type II (MOPD II) is a rare autosomal recessive inherited disorder form of primordial dwarfism. Mutations in the pericentrin (PCNT) gene on chromosome 21q22.3 cause MOPD II. The dentition affected by MOPD II shows hypoplastic maxillary and mandibular arches, microdontia and short-rooted teeth. The purpose of the present study was to examine the physicochemical properties and microstructures of a tooth affected with MOPD II.

**Methods:** Mandibular 2nd molar was collected from the MOPD II patient. The control tooth (Mandibular 2nd molar) was collected from normal control. Micro-computerized tomography (Micro-CT), Scanning Electron Microscopy (SEM), Energy Dispersive Spectrometry (EDS) and Vickers microhardness analysis were performed on the MOPD II and normal teeth.

**Results:** The morphology of the MOPD II tooth appeared to have malformed pulp and root and showed a smaller size than normal. The mineral density measurement showed that the MOPD II teeth had similar scores in the enamel, but lower scores in the dentin at the position of root half and apical compared to the normal teeth. The microhardness values were smaller in the cusp enamel and in the dentin at the position of root half and apical of the MOPD II compared to the normal.

**Conclusions:** Dental management of patients with MOPD II syndrome might be difficult because of microdontia, short-rooted teeth, and poor oral hygiene. The differences in microstructure and physicochemical properties of the MOPD II compared with normal revealed by SEM, Micro-CT, and Vickers microhardness test might provide evidence of the dental problems in patients with MOPD II.

## **Glanzmann Thrombasthenia : Use of Soft Splint with Tranexamic Acid to Reduce Spontaneous Oral Bleeding**

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**Introduction:** Management of Glanzmann Thrombasthenia (GT), usually includes supportive measures and platelet transfusions. Repeated platelet transfusions could lead to auto immunization and makes the transfusion ineffective. The purpose of this case report is to highlight the use of soft splint along with tranexamic acid to reduce the spontaneous bleeding in the oral cavity.

**Case Report:** A seven year old female patient admitted in the Paediatric Intensive Care Unit (ICU) with a known medical history of GT was referred to paediatric dentist for opinion and management for bleeding gums. The patient required multiple teeth extractions due to severely carious teeth. History revealed that the patient was admitted to the hospital (casualty) three times within one month due to similar complaint leading to hypovolemic shock. Several transfusions procedures were done to stop the spontaneous bleeding. In order to stop the intra oral bleeding without transfusions, a novel method of using soft splint with tranexamic acid (TXA) in the area of spontaneous bleeding was employed with a successful follow up of seven months.

**Discussion:** Tranexamic Acid (TXA) inhibits the formation of plasmin that interferes with fibrinolysis, thereby preventing the breaking down of the clot. Soft splints had advantage of snugly fitting on the teeth and hence does not induce bleeding.

**Conclusion:** The present report showed that use of soft splint with tranexamic acid had been successful treatment option to stop spontaneous bleeding from the oral cavity in patients with GT.



**Moebius Syndrome: Clinical Case Report**

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**Introduction:** Moebius Syndrome is a rare congenital condition, characterized by total or partial paralysis of the facial and abducent nerves. The aim of this study is to report a clinical case of MS and present the evolution of dental treatment for a child with this condition over a period of 36 months.

**Case report:** A 9-year-old female patient with Moebius Syndrome presented herself at the Dental Clinic of the Municipality of Domingos Martins / ES complaining of a large number of carious lions. Intra-oral examination, generalized caries lesions, root debris, fistulas and associated deep bite were diagnosed. The treatment plan consisted of the emergency steps (extractions), adaptation of the oral environment with ionomer cement restorations and topical application of fluoride varnish for 4 weeks. Finally, completion of the restorative treatment with composite resin. After clinical treatment, insertion of the patient in a strict preventive maintenance program and referral for treatment of Functional Jaw Orthopedics.

**Discussion:** The implication of MS in the child's oral health is wide and quite complex. There is an imminent difficulty in treating these patients due to the limited opening of the mouth. Thus, it is clear the importance of frequent monitoring and clinical maintenance so that good results are achieved in relation to the prevention of caries disease.

**Conclusion:** After 36 months, it was concluded that the preventive maintenance program established was effective, with stabilization of caries disease and significant improvement of malocclusion with the use of Orthopedics.

**The Role of a Pediatric Dentist in the Dental Management of a Case of Cerebral Gigantism/Sotos Syndrome**

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**Introduction:** Sotos syndrome is a rare genetic disease characterized by key features such as premature overgrowth, accelerated bone development, macrocephaly and learning disabilities. This case report aims at describing the key clinical and dental features and management of a patient diagnosed with Sotos syndrome.

**Case report:** A 4-year-old female child weighing 28kg, reported to the dental unit, Ministry of health, Seychelles, with the chief complaint of premature loss of lower deciduous centrals, mobility of upper centrals and decay in the upper posterior teeth. The patient was delivered through cesarean section at 41 weeks of age. By 1 year of age, the child was taller and heavier ( 97th centile) than her peers. Other clinical features included delayed developmental milestones, downward slanting palpebral fissures, prominent forehead, macrocephaly and speech delay. MRI confirmed the diagnosis of Sotos syndrome owing to the asymmetry of left lateral ventricles. Due to the lack of motor coordination, the patient had history of repeated falls resulting in the mobility of maxillary primary central incisors. The dental examination revealed incompetent lips, high arched palate and decay in maxillary primary molars. OPG and hand and wrist radiographs were taken to assess dental and skeletal age.

**Discussion:** Dental care in children with Sotos syndrome poses a challenge due to intellectual disability and lack of communication skills. Extensive dental management will require general anesthesia.

**Conclusion:** Early prevention and timely reviews are key to good dental health in such cases owing to the behavioral problems.

## Is Cleft Lip and Palate Still a Taboo? A Case Report of Child Abuse

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**Introduction:** Cleft lip and palate are a frequent but significantly disfiguring congenital anomaly affecting children. Beside the multiple problems they pose, this visible deformity is a major social stigma in developing countries like India.

**Case Report:** A 3-month-old infant was reported and clinical examination revealed unilateral cleft on the right side associated with hypertelorism. The child appeared emaciated along with atypical injuries about which the parents failed to provide suitable answer. After detailed examination, it was suspected that the child was being abused. The child was sent back to pediatrician to rule out malnourishment and child abuse suspicion the same day. Follow up phone call revealed demise of the child a day after the dental visit and parents denied further follow up

**Discussion:** In children with clefts, child abuse is a grave situation and considered as a social stigma in India. Infanticide of such children is associated with superstitious beliefs and shame. India ranked 2nd among 27 countries in documented cleft-related infanticide reports. According to studies children under the age of 3 years are most commonly affected by oral injuries which is true for this case.

**Conclusion:** Regarding Indian context, child abuse needs serious consideration, particularly among the underprivileged rural and urban communities, where child protection systems are not developed. Reinforcement of positive behavior, education about treatment options in parents and appropriate training to pediatric dentist regarding child abuse will not only break this vicious cycle but also will save a precious life.

**Dental Management under General Anesthesia in a Child with Noonan Syndrome**

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**Introduction:** Noonan syndrome is an autosomal dominant condition caused by mutations in multiple genes such as PTPN11, SOS1, RAF1 and RIT1 and occurs one in 2,500 to 10,000 births affecting both genders equally. Noonan syndrome is characterized by distinctive clinical features such as short stature, chest deformity, congenital heart disease and mental delay, though their presentation depends on the severity. Orofacially, patients with Noonan syndrome present distinctive facial features including low junction of the ears, ptosis of eyelid, hypertelorism, micrognathia and malocclusion. The purpose of this study was to provide clinical considerations of dental management in pediatric patients with Noonan syndrome, especially who presents multiple caries.

**Case report:** In this case report, we report dental management of a two-year-old girl with Noonan syndrome who presented multiple caries in her primary dentition. Patient had cerebral palsy and mild hypertrophic cardiomyopathy. The dental procedure was successfully performed under general anesthesia.

**Discussion:** Wide range of behavioral problems were reported in association with Noonan syndrome. Hence for safety of our patient and efficiency of the overall dental treatment, general anesthesia was considered. As it is difficult to intubate patients with Noonan syndrome due to high arched palate, short webbed neck and micrognathia. Pediatrician consultation is necessary prior to dental treatments. Airway evaluation before general anesthesia is also crucial.

**Conclusion:** This case suggests general anesthesia can be chosen as an appropriate and effective means to treat patients with Noonan syndrome who present multiple caries.

### A Web Content Analysis on Cleft Lip and Palate Surgeries

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**Background:** Treatment for cleft lip and palate begin early in life and include elective surgical procedures as well. Traditionally the decision-making process was dominated by health care practitioners. With abundant sources of information available on internet, the paradigm is shifting towards a shared decision-making process. The aim of the present study was to assess the reliability of websites on cleft lip and palate surgeries using DISCERN tool.

**Methods:** The Google search engine was used to identify websites displaying information on cleft lip and palate surgeries. Duplicates, videos, blogs, newspaper content, etc were excluded. All included websites were assessed for quality of health information provided using the DISCERN tool by two independent reviewers. The readability of the websites was assessed using the Flesch-Kincaid readability scores. The web pages were also evaluated based on characteristics like position of web page on search result, presence of health on net seal, etc.

**Results:** A total 38 unique websites were assessed. About 11 websites were excluded due to different reasons. The Kappa value among the reviewers for inclusion of websites was 1 and for DISCERN scoring was 0.89. Around 68% of websites had DISCERN score 26. The overall scores ranged from 13 to 53 with mean score of 48.7(SD=6.54).

**Conclusion:** Guiding patients to use validated websites on cleft lip and palate surgeries will aid in shared decision-making process.

**Digital Volumetric Monitoring of Palate Growth in Children with Cleft Lip and Palate**

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**Background:** The literature lacks studies using digital resources to measure the volume of edentulous dental arches of children with cleft lip and palate and longitudinally evaluate the impairment of the rehabilitative plastic surgeries – cheiloplasty and palatoplasty. Thus, this study aimed to evaluate longitudinally the volume of the dental arches in children with unilateral cleft lip and palate before and after the rehabilitative plastic surgeries.

**Methods:** The sample was composed of 102 digitized dental casts of children with unilateral complete cleft lip (G1) and cleft lip and palate (G2). The palate volume was evaluated at three periods: pre-operative (T1), post-operative 1 (T2), and post-operative 2 (T3). The intra- and inter-examiner reliability was analyzed by Wilcoxon test/Dahlberg's formula and Interclass Correlation Coefficient, respectively. The intragroup comparison was analyzed by Wilcoxon test and Friedman test followed by post-hoc Dunn test. Mann-Whitney test was applied for the intergroup comparison ( $p < 0.05$ ).

**Results:** G1 had a significant growth at T2 ( $p = 0.031$ ). G2 demonstrated a positive development at T2, but decreased at T3 ( $p = 0.003$ ). The intergroup analysis revealed that G2 showed a greater volume at T1 and T2 ( $p < 0.0001$  and  $p = 0.0024$ , respectively). T2-T1 exhibited no statistically significant difference ( $p = 0.262$ ).

**Conclusion:** The cheiloplasty did not interfere in dental arch growth, while after palatoplasty, the estimated dental arch volume decreased in children with unilateral cleft lip and palate.

**Dental Management of a Patient with Hereditary Sensory and Autonomic Neuropathy Type IV**

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**Introduction:** Hereditary sensory and autonomic neuropathy (HSAN) type IV is a rare genetic condition caused by mutations in the NTRK1 gene. Characterized by anhidrosis, cognitive impairment and insensitivity to pain, it can result in repeated self-mutilating injuries including biting of the tongue, lips and buccal mucosa.

**Case Report:** A 3-year-old girl with HSAN type IV presented at the University Dental Hospital of Manchester with a tongue biting habit which had resulted in large areas of traumatic ulceration, severe bleeding and regular emesis. Her factitious behaviour had begun at age 18 months with self-extraction of the LRB, LRA and LLA. Family history was notable for HSAN type IV. The patient had previously undergone dental treatment under general anaesthetic (GA) to flatten cusps and smooth incisal edges with an aim to reduce soft tissue trauma. This had also involved direct composite restorations URC, URB, URA, ULA and LLC, followed by placement of preformed metal crowns URD, ULD, LLD and LRD. However, 12 months post-treatment the patient's self-injurious habit returned resulting in severe tongue lacerations. To prevent further trauma all remaining primary teeth were extracted under GA.

**Discussion:** Oral manifestations of HSAN type IV often develop in infants during eruption of the primary dentition. Prevention of oral injury can be achieved through smoothing of sharp cusps, dental extractions or use of a mouthguard in older children.

**Conclusion:** HSAN type IV can have severe consequences through self-inflicted trauma resulting in radical dental treatment. Supportive treatment is imperative in the prevention of such injuries.

**Rothmund–Thomson Syndrome with Partial Anodontia: A Rare Case Report**

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**Introduction:** As environmental causes of disease become better controlled, so genetic factors assume relatively greater importance. Genetics has transcended the field of health and has entered all walks of life in its application. Rothmund–Thomson syndrome (RTS), described in 1868 by the German ophthalmologist Rothmund is a rare autosomal recessive genodermatosis presenting in infancy. It presents with a characteristic facial rash (poikiloderma) associated with short stature, sparse scalp hair, sparse or absent eyelashes and/or eyebrows, juvenile cataracts, skeletal abnormalities, radial ray defects, premature aging and a predisposition to cancer. Microdontia, multiple crown malformations, delayed and ectopic eruption, supernumerary and congenitally missing short, conical root, early onset periodontitis are some of the oral manifestations associated with it.

**Case report:** A 10-year-old boy with Rothmund-Thomson syndrome reported to the department of pedodontics and preventive dentistry with Partial anodontia for which replacement of teeth was planned with a cu sile denture.

**Discussion:** Cu-Sil like dentures are designed to preserve the remaining natural teeth and thus the alveolar bone. They have a dramatic effect on retention and stability of denture.

**Conclusion:** Prosthodontic rehabilitation of partial anodontia patients can improve their oral functioning, appearance, self-confidence, and minimize the onset of emotional and psychological problems



**Dental Treatment of a Patient with DiGeorge Syndrome under General Anesthesia**

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**Introduction:** DiGeorge syndrome is a primary immunodeficiency disease caused by a segment deletion in the long arm of chromosome 22 at position 22q11.2 during early fetal development. The developmental defect leads to phenotypes including congenital cardiac anomalies, abnormal facial features, thymic hypoplasia, cleft palate, hypocalcemia, delayed behavioral and emotional development. In terms of oral manifestation, delayed eruption of permanent teeth, enamel hypoplasia, hypodontia, aberrant tooth shape, and dental caries are revealed. This report presents caries removal procedures performed on a patient with DiGeorge syndrome and suggests special care necessary for the patients.

**Case Report:** A 9-year-old boy with DiGeorge syndrome was referred to the Pediatric Department of Seoul National University Dental Hospital with the complaint of dental caries in both maxillary and mandibular molar. He had a history of receiving prosthetic heart valve surgery and cannula insertion operation due to tracheomalacia. He was also diagnosed with pulmonary hypertension and hypothyroidism. Due to the patient's condition and the severity of his dental caries, dental procedure under general anesthesia was planned.

**Discussion:** Dentists should be informed of the clinical characteristics of DiGeorge Syndrome. In particular, the reduction of stress level is crucial when treating patients with pulmonary hypertension. Thus, general anesthesia can be considered and prophylactic antibiotics should be required in the dental procedures to prevent infection.

**Conclusion:** DiGeorge syndrome patients need special care due to their delayed development and immunodeficiency. This case report suggests that dental procedure under general anesthesia is a safe method for DiGeorge syndrome patients.

## Dental Treatment of Uncooperative Patients with Williams Syndrome under General Anesthesia: Case Report

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**Introduction:** Williams syndrome is a rare congenital systemic disorder caused by a microdeletion of chromosome 7q11.23. Typical oral and dental characteristics are hypodontia, macroglossia, excessive interdental spacing, enamel hypoplasia/hypomineralization, and reduced mesio-distal dimensions in both primary and permanent teeth. The purpose of this presentation is to describe dental treatment of uncooperative patients with Williams syndrome under general anesthesia.

**Case report:** A 4-year-2-month old, 13 kg girl with Williams syndrome presented with multiple caries and was scheduled to be treated under general anesthesia. The patient had 12 primary teeth in need of caries treatment and four primary incisors requiring extraction. General anesthesia was induced and maintained, while vital signs were monitored during the entire course of treatment. Stainless steel crowns and zirconia crowns were successfully used to treat all caries, and four primary upper incisors were extracted. The treatment and anesthesia resulted in no complications during and after the operation.

**Discussion:** Williams syndrome is frequently associated with various medical complications. Since portrayal of anxiety or hyperactivity often necessitates sedation or general anesthesia during dental treatment, a thorough evaluation of systemic diseases is required. In order to perform safe and effective dental treatment, it is necessary to thoroughly evaluate and observe the patient before anesthesia as well as to prepare for emergencies.

**Conclusion:** Patients with Williams syndrome are especially prone to dental caries and periodontal disease. In order to maintain oral health, it is essential that patients make regular visits to the clinic for periodic dental care.

### Lysosomal Storage Disorders: A Case Series

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**Introduction:** Lysosomal Storage Disorders (LSD) describe a heterogeneous group of Inborn Errors of Metabolism. Mucopolysaccharidoses are caused by a deficiency in one of the eleven enzymes responsible for degradation of glycosaminoglycans. Dentally, TMJ pathology, dental anomalies, deviations in eruption and increased caries are evident across the seven distinct subtypes. Multiple sulfatase deficiency (MSD) is an extraordinarily rare type of LSD caused by deficiencies of all 17 sulfatases. The dental phenotype is poorly described.

**Case report:** Three patients with lysosomal storage disorders; Morquio-A (MPS IVA), Sanfilipo-B (MPS IIIB) and Multiple Sulfatase deficiency (MSD) were treated at Great Ormond Street Hospital. A 12-year-old female with Morquio-A syndrome presented with an ectopic canine, supernumerary teeth and enamel hypoplasia and received orthodontic alignment. A 7-year-old boy with Sanfilipo-B had gross caries of 10 primary teeth, requiring extraction under general anaesthetic. An 11-year-old boy with multiple sulfatase deficiency presented with an enamel-dentine fracture of the UL1 and a 3mm intrusion of the UR1.

**Discussion:** The management of LSDs causes formidable challenges. Behavioural difficulties can complicate treatment under local anaesthesia. Systemic manifestations such as glycosaminoglycan deposition and cardiac comorbidities cause varying levels of risk for anaesthetists. MSD patients have multifaceted behavioural challenges, attributed to constituent sulfatase deficient mucopolysaccharidoses (IID, II, IIA). Additionally, MSD patients typically have features of metachromatic leukodystrophy, X-linked chondrodysplasia punctata and X-linked ichthyosis.

**Conclusion:** These cases highlight the important role of paediatric dentists in liaising with the multidisciplinary team. Prevention of dental disease is paramount where there is a high risk of GA.

### Sanjad Sakati Syndrome: A Case Series

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**Introduction:** Sanjad-Sakati Syndrome (SSS) is a rare autosomal recessive disorder presenting with congenital hypoparathyroidism, prenatal and postnatal growth failure, facial dysmorphism and seizures. SSS is mainly seen in patients of Arabian origin. Characteristic dental features include high-arched palate, micrognathic mandible, microdontia, hypodontia, taurodontism, enamel hypoplasia, malocclusion and severe dental caries.

**Case Reports:** We report the cases of two patients referred to Great Ormond Street Hospital. Case one, an eight-year-old male was admitted to intensive care due to severe respiratory distress. After a period of medical stabilisation, he was referred to the dental department for odontogenic pain. Dentally, gross caries was evident necessitating extraction of nine primary teeth and all first permanent molars under general anaesthesia. Case two, a four-year-old female was admitted with acute kidney injury, recurrent sepsis and necrosis of feet and fingers. Dentally, gross caries was evident with an abscess of URA. Microdontia and enamel hypoplasia was also present. Treatment under general anaesthesia involved extraction of 11 primary teeth and a stainless-steel crown of LRE.

**Discussion:** A diverse range of dental features and gross caries is commonly seen in SSS. Hypocalcaemia during tooth development may contribute to enamel hypoplasia, delayed eruption and cessation of root formation. Midface hypoplasia and upper airway restriction predispose to major respiratory problems. Additionally, seizures and endocrine anomalies further increase the general anaesthetic risk.

**Conclusion:** Multidisciplinary management is essential in management of SSS patients. Paediatric dentists have an indispensable role in optimising preventive strategies where there is a high risk of general anaesthesia.

**Phonoarticulación in Patients with Down Syndrome**

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**Background:** Articulation disorders are present in 95% of children with Down Syndrome (DS), stemming from incorrect coordination and anatomical and physiological differences. Furthermore, 40 - 80% have decreased hearing, affecting language development and, therefore, their quality of life. The health team must recognize, on time, possible variants.

**Methods:** An article research was carried out during the year 2019, through the databases PubMed, Cochrane Library and EBSCO; scientific journals and retrograde search, using MeSH terms and keywords "Down Syndrome", "Speech", "trisomy 21", "speech disorders", "phonetic", and "children", connected by Boolean terms "AND" and "OR". Articles were considered without language or year restrictions; however, those carried out in the adult population or associated with other pathologies were excluded.

**Results:** 7 articles were selected from a total of 1,260, all of them in English. 100% stated that children with DS have articulation disorders, describing unfavorable characteristics such as muscle hypotonia, hearing loss, and lack of articulatory movement coordination. Speech disorders' origins are multiple, and not only the result of a cognitive disability. The most frequent are the lack of intelligibility, errors when pronouncing consonants and apraxia.

**Conclusions:** The management of pediatric patients with DS requires multidisciplinary work, especially with speech therapy. Dentists can identify maxillofacial and pharyngeal characteristics, promptly refer and participate in the multidisciplinary care team. Regarding the possible extrapolation of results, no Spanish-speaking articles are presented, so they do not apply to populations with such language.

## **Full Mouth Rehabilitation of a Patient with Medullary Nephrocalcinosis Syndrome, Amelogenesis Imperfecta and Hyperparathyroidism: A Case Report**

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**Introduction:** Amelogenesis imperfecta is an inherited defect of tooth enamel. Only a few cases of AI have been reported to occur in association with syndromes and metabolic conditions. McGibbon Syndrome or AI and Nephrocalcinosis Syndrome are such disorders with defective enamel and renal calcifications. Nephrocalcinosis is an abnormality caused by the deposition of calcium salts into the renal medulla, specifically the distal convoluted tubules.

**Case report:** A 16 year girl patient reported With a chief complaint of absence of multiple permanent teeth in maxillary and mandibular arch. The family history was otherwise unremarkable. Intraoral examination revealed yellow to yellowish-brown teeth with rough surfaces. Also revealed absence of mandibular right and left permanent central and lateral incisors , canines and premolars followed by maxillary right premolars. Orthopantomography showed deciduous teeth and incomplete permanent dentition with the delayed eruption and several impacted permanent teeth. Significant amount of bone covering was present but there had been no axial movement of the teeth through bone. Radiograph also revealed absence of periodontal ligament space and lamina dura in primary and erupted permanent teeth. Intrapulpal calcifications in erupted and unerupted molars were evident. Based on her intraoral condition full mouth rehabilitation was planned.

**Discussion:** A diagnosis of hypoplastic AI was made and the patient was further investigated for Ultrasound and x-ray of kidney, ureter, bladder which showed nephrocalcinosis with bilateral multiple calculi and few small calcifications. Biochemical and haematological investigation showed hyper parathyroidism

conclusion: diagnosis and rehabilitation of such patient is challenging to a dentist as multidisciplinary approach is needed to achieve desired result.

**Pre-Surgical Infant Orthopaedics: A Contemporary Course of Action for Cleft Lip and Palate**

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**Introduction:** Presurgical orthopaedic therapy is technique used to mold the maxillary, alveolar, and nasal tissues of an infant with a unilateral or bilateral cleft lip and palate. Naso alveolar molding is a presurgical treatment modality which associated with promising long-term trends leading to reduced secondary corrections. Various modified PNAM techniques are used for better retraction, and reposition the pre maxilla.

**Case report:** An 8 days old male infant was reported to our department with complete bilateral cleft lip and palate with rotated premaxilla on left side. The PNAM appliance given in this case was a modified one (pre-directional appliance) which was fabricated and delivered to correct the rotated premaxilla. It was replaced by alveolar molding plate upon the achievement of centralization of premaxilla. Once correction was done activation of NAM appliance was done for the 3 months. Primary lip repair was performed at the age of 6 months and primary palate repair was done at age of 11 month and followed up till date.

**Discussion:** As per say clinical procedures and fabrication of NAM plate procedure is started at early 2nd week after birth because Molding of tissues is easier in neonates due to raised level of hyaluronic acid and maternal circulating estrogen. To correct the rotated premaxilla Various modified PNAM techniques are implemented and custom-made molding plate of acrylic is inserted to direct the growth of the alveolus in desired position.

**Conclusion:** PNAM is significant technique to correct, align and retract the pre maxilla. columella lengthening was adequate and satisfactory.

**Cherubism: Case Reports and a Literature Review**

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**Introduction:** Cherubism is a rare, benign, autosomal-dominant bone disease. It is self-limiting, generally presents between 2-7 years, progresses until puberty and regresses thereafter. It is characterised by bilateral bony enlargement of the mandible and maxilla. Dentally many abnormalities are seen, including; displacing, absent, supernumerary and malformed teeth in addition to eruption disturbances. Clinical and radiographic examination is generally sufficient to establish a diagnosis but genetic testing can also be used. Conservative management is preferred unless there are significant functional, aesthetic or psychological concerns.

**Case Report:** Two siblings presented aged 11 and 12 years. There was a positive history of cherubism with their maternal aunt and uncles being affected. Neither presented with gross facial abnormalities, nasal obstruction or orbital involvement. Potential orbital sequelae can include; diplopia, proptosis, globe displacement, strabismus and rarely optic neuropathy and loss of vision.

Dentally both presented with early loss of deciduous teeth due to caries. This was in addition to a number of severely ectopic teeth, some lay bucco-lingually, others adjacent to the lower border of the mandible and impacted canines which crossed the mandibular midline. There were also a number of transpositions and significantly malformed teeth. One had an overjet of 12mm.

**Discussion:** The management of these cases was very complex and necessitated a multidisciplinary approach involving; Paediatric Dentistry, Orthodontics, Oral and Maxillofacial Surgery and Psychology. The literature review demonstrates the differential diagnosis, staging and histology of the condition.

**Conclusion:** These cases demonstrates many of the classic clinical and radiographic findings in children with cherubism.



**Oral Rehabilitation of Patient with Di-George Syndrome Under General Anesthesia**Elif Kardes, Peris Celikel, Sera Simsek Derelioglu*Department of Pediatric Dentistry, Ataturk University Faculty of Dentistry, Erzurum, Turkey*

**Introduction:** Di-George syndrome is a disease caused by the deletion of a small segment of chromosome 22. Characteristic signs and symptoms include birth defects like congenital heart disease, palate defects, learning disabilities, mild differences in facial features, and recurrent infections. The mandible is hypoplastic (micrognathia). Enamel aberrations related to hypocalcemia may result in a higher frequency of dental caries, and in some cases hypodontia is detected.

**Case Report:** 6-year-old male patient diagnosed with Di-George syndrome administered to our clinic with the complaints of teeth pain and recurrent dental infections. The patient had walking difficulties, mental and developmental retardation. In clinical and radiographic examination, it was observed that tooth number 46 was erupting, and caries had progressed to pulp in all primary teeth. After the necessary consultations were obtained the patient was taken to general anesthesia. Fissure sealant was applied to 46. All the primary teeth were extracted.

**Discussion:** Considering the reasons such as the patient's mental retardation, the family's inadequate care in the patient's oral care, poor oral hygiene and socioeconomic status, poor retentive tooth structure for the restoration of the teeth, risk of aspirating the restoration or the SSC in a possible decementation, and not leaving a tooth that may be a possible source of infection in Di-George syndrome patients with weak immune system, it was decided that the extraction of all primary teeth would be more appropriate in this case.

**Conclusion:** In syndromic patients with mental retardation, acting radically in the treatments performed under general anesthesia may be needed. For this reason, attention to oral care becomes more important, and teeth should be protected from caries as much as possible with regular dentist controls.

### A Case Report on Paracetamol Induced Stevens – Johnson Syndrome

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**Introduction:** Stevens-Johnson Syndrome is a rare, vesiculobullous disease characterized by severe mucosal erosions that involve the skin and mucous membrane. Adverse drug reactions are the major common cause for Stevens–Johnson Syndrome. This case report of drug-induced Stevens-Johnson Syndrome is important as it was caused by a commonly used drug – i.e., Paracetamol.

**Case report:** A 9 year-old male child was referred from Department of Pediatrics to Department of Pediatric and Preventive Dentistry with a chief complaint of painful and bleeding lips since the previous night. Past medical history revealed that the patient had fever for which Paracetamol was taken as self medication. Extraoral examination revealed erosion, bleeding and crusting of lips. Based on the clinical features, it was diagnosed as Stevens–Johnson Syndrome. The patient was treated with systemic steroids, Injectable Hydrocortisone 50 mg QID for 8 days. Mucopain application for lip lesions was advocated. The patient was advised to perform saline sponging every 2 hours for 1 week.

**Discussion:** Stevens–Johnson Syndrome is a rare type 4 hypersensitivity reaction with a life threatening condition. Oral manifestations may be the initial complaint of Stevens-Johnson Syndrome patients and should not be ignored. Common drugs may have the potential to trigger development of Stevens–Johnson Syndrome.

**Conclusion:** Early intervention based on appropriate diagnosis of Stevens-Johnson Syndrome can help avoid further life-threatening complications.

**Sickle cell Anemia and Turner's Tooth Hypoplasia : A Case Report**

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**Introduction:** Sickle cell anemia (SCA) is an inherited disorder of hemoglobin synthesis, and the most common genetic disease in the world. It is characterized by recurrent attacks of pain, frequent bacterial infections and shortened life expectancy. SCA frequently exhibits multisystemic manifestations including oral disorders. Turner's hypoplasia, is a term used to describe a permanent tooth with a hypoplastic defect. This case report describes the dental care protocol for a child with SCA.

**Case report:** A 10-year-old male child was referred to the Dental Care for Special Patients Clinic at the Ribeirão Preto Dental School, University of São Paulo. Medical history revealed that he is a patient with SCA. His main complaint was pain in a lower tooth. The patient reported the extraction of primary tooth 75 due to early caries. In the intra-oral clinical examination, the tooth 35 showed type IV enamel hypoplasia, caries, yellowish discoloration, fistula and percussion pain. Radiographically, revealed diffuse structure and inadequate root formation. After medical consultation, the treatment plan included antibiotic therapy with amoxicillin 1 hour before tooth extraction 35 and later a space maintainer. In the postoperative, the healing was satisfactory.

**Discussion:** The dental surgeon must be aware of the need to eliminate oral sources of infection and immediate treatment of acute infections in patients with SCA to prevent medical complications.

**Conclusion:** The oral infections are considered a high risk factor in the precipitation of a sickle cell crisis. Antibiotic prophylaxis is recommended prior to any clinical procedures that may result in bleeding

**Rehabilitation of Pediatric Dentistry to Patients with Cleft Lips and Palates as Part of Surgical Protocol**

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**Background:** The cleft lip and palate is one of the most common congenital malformations that affect the development of bucco-facial structures and cause the patient multiple problems of food habits, nasal breath, hearing, facial growth, dental development, phonation and esthetic.

**Case Report:** Male patient from 6 years old to 9 months years old. Reason for consultation “Caries revision” in order to perform his last surgery. To the interrogation, the mother means that the child got his lip and palate operated, 37-week pregnancy without any complications, regular buccal hygiene.

To the physical inspection, mesofacial patient, straight profile, scar is observed at the level of the lift upper left, to the intraoral inspection is observed palatal fissure, absence of the dental organ 62, and carious lesions.

Therapeutic procedure was performed during 5 sessions, working on the oral cavity through quadrants. The preventive plan was performed in the first appointment, control of biofilm, brushing technique in front of parents, prophylaxis, application of fluoride, 4 applications were performed on the whole, and pit and fissures sealants, dental resins were performed in the dental organs during the restorative plan which presented carious lesions, absolute isolation was performed, caries removal, cavity preparation, resin filling, and finally polishing of each dental organ.

**Discussion:** The patient improved his hygiene habits, food habits, and postoperative preventions.

**Conclusions:** The performed treatment performed the planned expectations, it is suggested to continue with the preventive educational implementation to keep and conserve optimal buccodental conditions, remitted patient to CEO.

### Early Detection of Syndromes and Phenotyping

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**Background:** Syndromes affecting the craniofacial and dental structures show a wide spectrum and may have a different degree of severity. Many syndromes have recognizable facial features that are highly informative to clinical geneticists. Progress in genetics and molecular biology has resulted in the emergence of new concepts to explain the etiology and pathogenesis of many human disease processes including oro-dental diseases. Care of individuals with syndromes affecting craniofacial and dental structures are mostly treated by an interdisciplinary team. Early diagnosis is often crucial for the effective treatment of functional and developmental aspects. The field of dental phenomics provides many opportunities to elucidate the roles of genetic, epigenetic and environmental factors in craniofacial development. Deep phenotyping of craniofacial and dental structures is needed for the identification of genetic variants and environmental factors in the pathogenesis of these syndromes.

**Literature review:** Bartzela et al. selected 13 syndromes associated with facial, oral, and/or dental conditions. Prevalence of the disorders is around 1/100,000 of the population or higher and its presence is evident in the genomic locus/loci association or causal gene. They updated recent advances in genetic etiology and genotype-phenotype relations of 13 syndromes affecting craniofacial and dental structures.

**Conclusion:** As dental development and facial growth are lagging behind deep phenotyping of craniofacial syndromes will only be possible in young adulthood. The early detection of syndromes affecting craniofacial and dental structures, improves genetic diagnostic counseling and long-term treatment planning.

### **Mandibular Distraction Osteogenesis in Children with Severe Upper Airway Obstruction: Case Reports**

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**Introduction:** Severe airway obstruction in obstructive sleep apnea (OSA) can be a debilitating, even life-threatening, condition. If left untreated, OSA can lead to significant behavioural, cognitive, psychiatric, endocrine and cardiovascular morbidities. Multidisciplinary care involving dental and medical disciplines is beneficial to improve the patients' quality of life.

**Case report:** This paper describes the effects of mandibular distraction osteogenesis (DO) in 2 children with severe micrognathia and OSA. The first case is a 3-year-old boy with Treacher Collins Syndrome with severe upper airway obstruction. He underwent mandibular advancement by means of DO to improve his facial appearance as well as his airway. The second report describes a 4-year-old girl with Nager Acrofacial Dysostosis, which is an inherited disorder of craniofacial, limb and musculoskeletal anomalies. DO of the mandible was carried out in view of her appearance as well as her OSA problem. Both cases had tracheostomy since postnatal period and were eventually weaned off tracheostomy following mandibular DO with about 12 months' activation for the first case and about 18 months' activation for the second case.

**Discussion:** DO is a treatment technique used for the correction of specific skeletal deformities. Mandibular DO is useful for the correction of facial asymmetry, restore proper occlusion and create an appropriate airway in children with micrognathia and OSA

**Conclusion:** Management of severe airway obstruction in OSA associated with mandibular deformities is challenging. The aim of the mandibular DO in these cases was for decannulation of tracheostomy, which then resulted in improved swallowing.

**Oral Health Habits and Dental Caries of Children with Osteogenesis Imperfecta**

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**Background:** To present oral hygiene habits and dental caries scheme in a group of children with osteogenesis imperfecta (OI).

**Methods:** Twenty-three patients 5-17 yrs (14 male) with OI completed a questionnaire and underwent clinical examination after obtaining informed consent. Clinical parameters registered were: DMFT, dmft, CPI, OHI. Oral health related habits included dental visits, tooth brushing, flossing, use of mouth rinses, consumption of sweets and sugary drinks. Descriptive statistics and Spearman correlation coefficient were used (statistical significance  $p \leq 0.05$ ).

**Results:** Mean age of the patients was 9.86 yrs, while caries-free were 35% for the primary and 39% for the permanent dentition. Mean dmft: 3.18 (SD: 4.03), DMFT: 2.65 (SD: 4.14), CPI:1.43 (SD: 0.5) and OHI:2.3 (SD: 0.76). Thirty percent visited the dentist rarely, 48% brushed once daily and most of them did not floss (87%) or mouth rinse (91%). Daily sweet consumption was reported by 39% of the patients, mostly between meals (78%), while 74% had no sugary drinks. Most affected teeth were 1st permanent molars, followed by 2nd bicuspid and 2nd primary molars, followed by the 1st ones. The least affected teeth were lower incisors for both dentitions. DMFT correlated with patients' age ( $p=0.006$ ) and consumption of sweets between meals was negatively correlated with brushing ( $p=0.001$ ) and flossing frequency ( $p=0.032$ ).

**Conclusions:** Dental caries and poor oral hygiene are common problems in patients with OI and therefore dental examination should be part of the full clinical evaluation. Proper daily habits must be reinforced to maintain good oral health.

**Challenges in Prosthetic Management of an Ectodermal Dysplasia Patient, with 15 years Follow Up**

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**Introduction:** Full mouth rehabilitation of children with ectodermal dysplasia (ED) is a challenge due to cooperation, and unique characteristics of the oral structures and the teeth. The aim of this case report is to present the challenges faced with the prosthetic rehabilitation of a young boy with ED during a period of 15 years.

**Case Report:** A 3 years old boy with hypohidrotic ectodermal dysplasia, presented to the clinic with aesthetic and functional problems. Clinical and radiographic examination revealed two upper second primary molars and two lower first permanent molars tooth buds. A full denture for the lower and an overdenture for the upper jaw were constructed and they were replaced at the ages of 7 and 14 yrs. During the follow up period, several issues were addressed: cooperation, acceptance, function and fractures of the dentures and the eruption of the two molars. Problems were resolved taking into consideration patients' growth and development and individuals needs.

**Discussion:** Prosthetic rehabilitation of children with ED requires an interdisciplinary approach with respect to the special needs of the patients and their families. The greatest challenge is to deal with behavior of the young patients to guide them through the early years to adapt successfully to the removable dentures until growth is completed and implants can be used for placement of fixed prostheses.

**Conclusion:** The role of the Paediatric Dentist is of paramount importance in the prosthetic management of children with ED, but always as part of an interdisciplinary team.



**Fetal Alcohol Syndrome: Two Clinical Cases Report**

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**Introduction:** Fetal alcohol syndrome (FAS) consists on multi-systemic abnormalities caused by excessive alcohol consumption during pregnancy. The main consequences are craniofacial anomalies, intra- and extrauterine growth deficiency, central nervous system dysfunctions, (neurological abnormalities, behavioral changes, neuropsychomotor development delay, and intellectual disability), several associated malformations, mainly cardiac, ocular, renal and spinal disorders, antisocial personality, hyperactivity and orofacial manifestations. The aim of this study is to present two clinical cases of FAS treated at the dental outpatient clinic of a university hospital in Minas Gerais (Brazil).

**Case report:** Case 1: A 16-year-old, with physical and intellectual development severely affected, low weight and stature, small eyes and head, decreased brain circumference, bone alteration in the spine, chronic constipation, asthma and cognitive deficits. Clinically, the patient presents an atrophic arch, dental impactions, absence of teeth, large amount of biofilm and presence of carious lesions in several teeth. Case 2: A 6-year-old that presents with cognitive deficits, aggressiveness, and visual difficulty, with no systemic or dental alterations. Both have difficulty in communicating and adapting to dental procedures during appointments.

**Discussion:** The manifestations of FAS may vary according to the gestational period in which excessive alcohol consumption was used, with the brain being the most vulnerable organ.

**Conclusion:** The case reports highlight the importance of of dentistry as part of the multidisciplinary team in the caring of patients with FAS, as the treatment always demands several specialties. There is also a need for greater awareness of the female population of childbearing age, about the risks of alcohol to the fetus.

**Prosthetic Rehabilitation of a Child with Rubinstein Taybi Syndrome after Dental Trauma: A Case Report**

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**Introduction:** Rubinstein Taybi Syndrome (RTS) has a genetic origin on chromosome 16 and has physical characteristics, physical and mental development delay, and may present with oral alterations. The objective of this paper is to report a case of prosthetic rehabilitation of a patient with the syndrome who, due to dental trauma, lost teeth.

**Case Report:** Female patient, aged 4 years and 7 months, with RTS. After the dental trauma, she lost the upper central incisors (5.1; 6.1). The data collection procedure was carried out through careful clinical and complementary exams. After the diagnosis and establishment of the treatment plan, we chose to make a Denari's prosthesis. It has a tube-bar mechanism that allows maxillary growth and development and does not require minimal preparation on the teeth for its cementation. The patient's parent was instructed to have an appointment with a speech therapist, as well as periodic visits to the dentist for clinical follow-up.

**Discussion:** The loss of anterior deciduous teeth may be associated with trauma to the anterior region. Dental absence can affect the development and behavior of children, promoting a change in daily routine and impacting the quality of life of the whole family. The Denari's prosthesis is a viable treatment option, as it accommodates the child's maxillary growth.

**Conclusion:** The early loss of primary teeth is still a problem in pediatric dentistry. The child's oral rehabilitation with the aesthetic-functional Denari appliance, provided restoration of the functions of the stomatognathic system, corrected deleterious habits and helped with phonetics.

### Cockayne Syndrome: A Case Report

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**Introduction:** Cockayne Syndrome is an autosomal recessive, genetic disorder, characterized by multisystem involvement, with progressive and intense neurological impairment. This syndrome occurs with a frequency of 1/100000 in live births.

**Case Report:** A 9-year old male patient was the first child of healthy parents of a consanguineous marriage and referred for dental examination. A clinical assessment of his physical features revealed sunken eyes, a thin and beaklike nose, and large ears, which all give the patient a 'birdlike' appearance. He had motor and mental retardation. Intraoral examination displayed a deeply arched palate, restricted temporomandibular joint movements, gingivitis, and common deep caries on teeth. Composite restoration was done on teeth 11,21,16,36,46 and 54,55, 64,65,74 teeth were extracted with local anesthesia. Oral hygiene instructions were taught to the patient.

**Discussion:** Characteristic facial development results in a thin prominent nose, prognathism, sunken eyes, and a lack of subcutaneous fat. Other major neurological abnormalities include sensorineural hearing loss, ataxia, spasticity, myoclonus, and gait disturbance; similar characteristic findings were noticed in the present case. The usual oral findings are delayed deciduous teeth eruption, oligodontia, short roots, higher incidence of caries, a deep palate, atrophy of the alveolar processes, mandibular prognathism, and condylar hypoplasia. We noticed a high arched palate and common dental caries in the present case.

**Conclusion:** Craniofacial and oral anomalies and dental caries are common in the CS. Although life expectancy is relatively short for these individuals, the pediatric dentist plays a significant role in managing the CS patient. Early dental evaluation and parental counseling have the utmost significance.

**An Overview of Cleft Lip and Palate with an Insight on Presurgical Naso-alveolar Moulding (PNAM)**

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**Background:** Cleft lip and palate (CLP) are the most common congenital multifactorial anomaly of the orofacial complex. Any disturbance in fusion during the development of face can result in cleft formation ranging from a slight notch in the lip to complete separation. Children with CLP suffer from a variety of problems right from the birth (feeding difficulties, speech defects, improper growth and development of maxilla along with overall facial development posing a psychosocial stigma).

PNAM is a modified infant orthopedics technique that reduces the nasal deformity along with reduction in severity of alveolar defect before surgery. It helps in reducing postoperative scar, better nasal tip projection, and more symmetrical nasolabial complex.

**Literature Review:** Aminpour S and Tollefson TT. 2008: PNAM allows repositioning of the maxillary alveolus and surrounding soft tissues especially in severely wide clefts.

Tiwari S, et al. 2014: PNAM serves dual functions by acting as a feeding, as well as molding appliance. Parents and caregivers must receive adequate training, education, active support and encouragement.

Gandedkar NH, et al. 2015: NAM is an effective method for reducing cleft and improving nose anatomy.

Thakur S and Kapoor AK. 2017: PNAM should be advocated in all patients with unilateral cleft lip and palate as a routine procedure to improve the surgical results and enhance the aesthetics and function with minimal surgeries.

**Conclusions:** The treatment of CLP is a multidisciplinary team approach where PNAM serves as an efficient adjunct for reducing the hard and soft tissue deformity.

**Trichorinophalangial Syndrome type 1: Unusual Case Report**

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**Introduction:** Trichorhinophalangeal syndrome type 1 (TRPS) is a rare and autosomal dominant genetic disorder caused by defects involving TRPS1 on chromosome 8. This work aims to report the entire systemic and intra-oral phenotype of a patient with trichorhinophalangeal syndrome type I.

**Case report:** Approved by the Research Ethics Committee # 3,392,996. Name initials MCSP, aged 11, with no consanguinity between parents and complications during pregnancy. At birth, he had a left unilateral cleft lip, cartilage dehiscence in the nasal region. The systemic changes observed were short stature, bone epiphysis, arthritis in the arms, changes in the hip, neurological development compatible with age, alopecia in the facial region and scalp, palpebral ptosis, low auricular implantation and pear-shaped nose and supernumerary teeth in the oral cavity.

**Discussion:** Trichorhinophalangeal syndrome type I is a rare genetic disorder, and in most cases, it is autosomal dominant. It is characterized by a haploinsufficiency of the TRPS1 gene, which is located on chromosome 8, involved in the regulation of bones and hair that encodes a finger-zinc transcription factor involved in the regulation of bones and hair. The patient with the syndrome may have skeletal, craniofacial and oral cavity changes. A karyotype test was performed, and TRPS1 was diagnosed with two characteristics not previously described in the literature: left unilateral cleft lip and cartilage dehiscence in the nasal region.

**Conclusion:** Knowledge of new phenotypic characteristics is important to facilitate early diagnosis and to be able to offer better patient care and survival.