



# Continued Root Development After Replantation of Traumatic Avulsed Incisor: a Case Report

Weiqian Jia, Man Qin

Department of Pediatric Dentistry, Peking University School and Hospital of Stomatology, Beijing, China

## Chief Introduction

- **Patient information:** a 6.5-year-old girl
- **Chief complaint:** upper anterior teeth avulsed **40 min** ago.
- **Dental history:** after avulsion, the tooth was washed and stored in **tap water**.
- **Examination:** the avulsed maxillary left central incisor had an immature open apex. Root surface was contaminated.
- **Treatment plan:** tooth replantation
- **Treatment procedure:** the avulsed 21 was immersed and washed in normal saline for 20 min until root surface was clean. Put the tooth back into its socket, stabilized for 4 weeks using flexible splint (Fig 1).

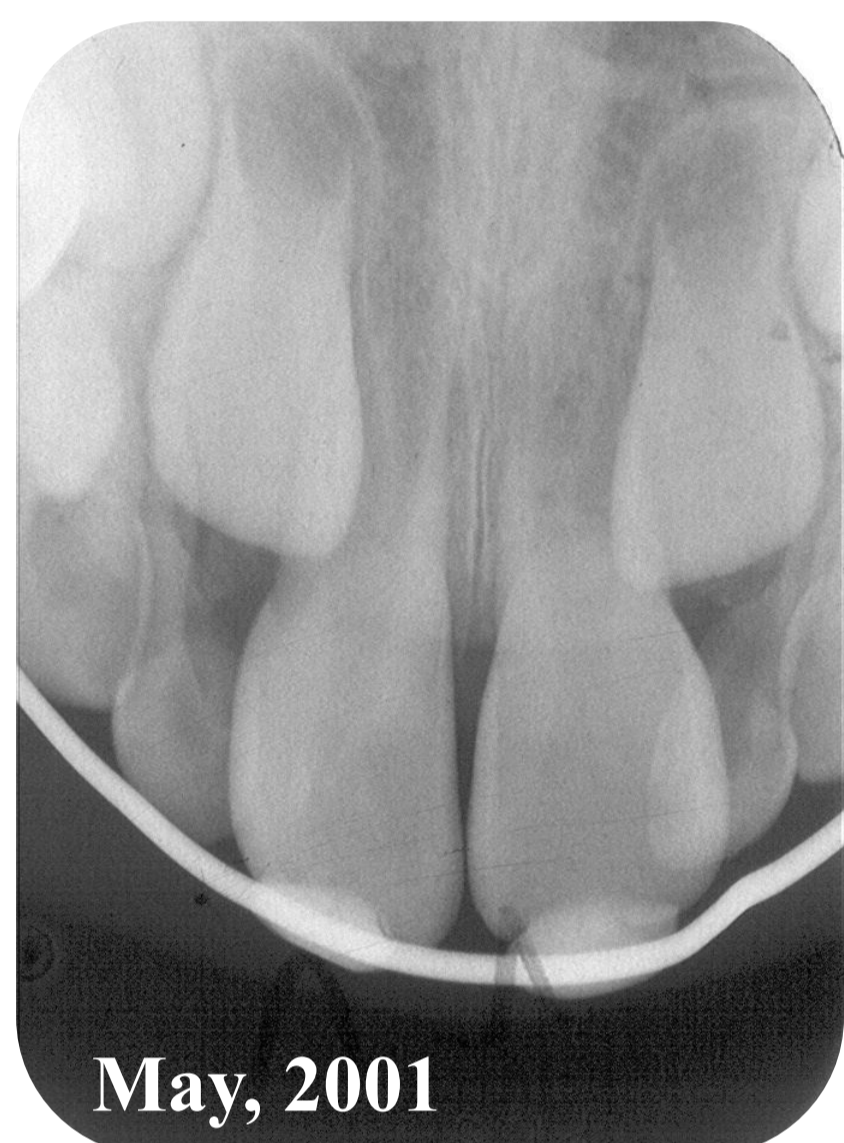


Fig 1. Immediate after replantation.



Fig 2. The root continued to develop without symptom.

In the first 5 months, tooth 21 was asymptomatic, and radiographic examination showed root development (Fig 2). Toothache occurred at 6th month. The diagnosis was pulpitis and apexogenesis was performed.



Fig 3. 8 months later, almost normal root length development was completed.



Fig 4. Dentin bridge formed under pulp capping material.

3 years later, root continued to develop and the dentin bridge was formed under pulp capping material (Fig 4). Therefore, the upper part of the root canal was filled with gutta-percha.

At 6 years follow-up, the periodontal space was remarkable, and no root resorption was observed by radiographic examination. However, root canal calcification occurred in the apical two thirds.

The patient received orthodontic treatment to solve crowding and protrusion problems when she was 13 (6 years after injury).



Fig 5. During the first 16 months of orthodontic treatment, the tooth was stable.



Fig 6. In the next 6 months, the apical third of the root was gradually resorbed.



Fig 7. 20 months later, there was no further resorption after orthodontic force reduction and appliance removal.



Fig 8. Before and after orthodontic treatment.

Orthodontic treatment lasted 2.5 years. No progressive resorption was observed afterwards (Fig 7). Finally, the tooth was restored with ceramic veneer for esthetics.

The overall follow-up time was 10 years.

## Comments:

• Periodontal healing was achieved in this case, yet rarely seen when tooth was stored in an unfavorable conditions. Continued root formation indicates pulp vitality through apexogenesis.

• Orthodontic treatment may lead to root resorption in replanted teeth, therefore force modification is required to reduce the risk.

• The goal of replantation is to preserve the tooth and the volume of alveolar bone for further prosthodontics.