

# Case Report: Repeated Avulsions of Permanent Central Incisors

Allison Petty DMD, Mary Beth Giacona DDS, Madhu Mohan DMD  
Rutgers School of Dental Medicine, Newark, NJ, USA



**Review:** Permanent tooth avulsion is a relatively rare catastrophic injury, accounting for 0.5-3% of all reported dental trauma.<sup>1</sup> Permanent anterior tooth avulsion can lead to pulpal necrosis, pulp canal obliteration, inflammatory root resorption and ankylosis, resulting in very serious esthetic and functional defects.

Appropriate and timely patient management is crucial to improving the long-term prognosis for avulsed teeth. Ideal splinting is one of the strongest predictors of pulpal and periodontal healing in avulsed teeth.<sup>2</sup> Clinical management of pediatric patients with avulsed permanent teeth is often complicated by patient-related factors such as level of cooperation and parental expectations. Given the life-long implications of permanent tooth loss, it is crucial for dentists to provide optimal care at the time of injury and during the post-acute treatment period.

**Introduction:** A healthy 7 year-old African American male presented to the Emergency Department (ED) at University Hospital in Newark, NJ with traumatic avulsion of both maxillary central incisors. The injury occurred while the child was playing inside his home. At presentation, the child had Class II, division 1 occlusion, confirmed by photographs provided by his mother. It has been shown that children with Class II have increased risk of dental trauma.<sup>3</sup>

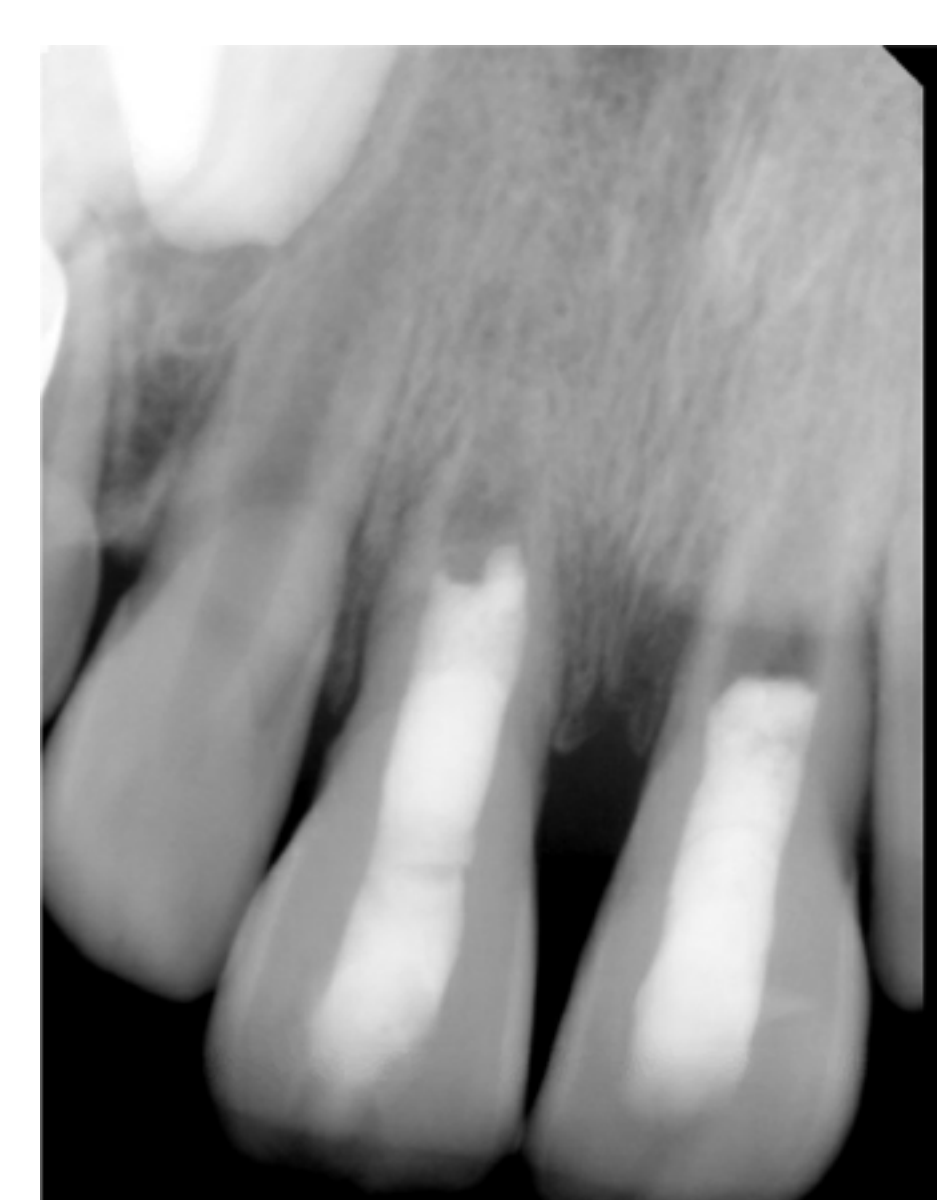


Figure A. Initial implantation    Figure B. After apexification    Figure C. Day 168 radiograph

**Case:**

At presentation in the ED (Day 0) teeth #8 and #9 had been stored without any liquid medium in a plastic bag for three hours. The on-call dental resident replanted the teeth and splinted with flexible splint (Splint Mat) and flowable composite. The patient was seen the next day in the Pediatric Dental Clinic at Rutgers School of Dental Medicine (RSDM), both teeth were noted to have open apices. (Fig A) Patient unfortunately did not return for follow up until 45 days later at which time the splint was removed. On Day 60 follow up the teeth were asymptomatic and non-mobile, and the patient was referred for orthodontic and endodontic evaluations. Apexification was completed on Day 99 in the Endodontic Clinic at RSDM: obturation with a collagen plug, 3mm of MTA and gutta percha, and sealer using warm vertical condensation. (Fig B)

On Day 138 the child fell in his home again, resulting in a second avulsion of teeth #8 and #9. The on-call resident replanted and splinted the teeth in the ED about four hours after the injury. An hour after the child left the hospital, replantation and splinting failed and the teeth were avulsed for a third time.

On Day 140 the child presented to the Pediatric Dental Clinic at RSDM with teeth #8 and #9 stored in milk since the third avulsion (about 45 hours). Despite the hopeless prognosis, the patient's mother consented to another replantation with the goal of preserving anterior bone for even a minimum amount of time. By Day 168, the maxillary central incisors had grade III mobility with radiographic evidence of bone resorption and the decision was made to extract the teeth. (Fig C) Five days later, Day 173, an impression was made for fabrication of a Nance appliance with pontics for #8 and #9 and molar bands on teeth #3 and #14. The appliance was delivered on Day 187 and cemented with Ketac. (Fig E) Two months later, at patient's recall exam, prosthesis was intact and both mother and patient expressed satisfaction with esthetics and function of device. Patient will have continued follow-up at RSDM to provide adjustments and/or repairs to prosthesis as needed.

**References:**

- 1) Andreasen JO, Andreasen FM. Avulsions. In: Andreasen JO, Andreasen FM, Andersson L editor(s). *Textbook and Color Atlas of Traumatic Injuries to the Teeth*. 4th Edition. Copenhagen: Blackwell Munksgaard, 2007:444-88.
- 2) Sobczak-Zagalska, H. and K. Emerich (2020). "Best Splinting Methods in Case of Dental Injury-A Literature Review." *J Clin Pediatr Dent* 44(2): 71-78.
- 3) Jones, L. C. (2020). "Dental Trauma." *Oral Maxillofac Surg Clin North Am* 32(4): 631-638.



Figure D. Day 60 clinical

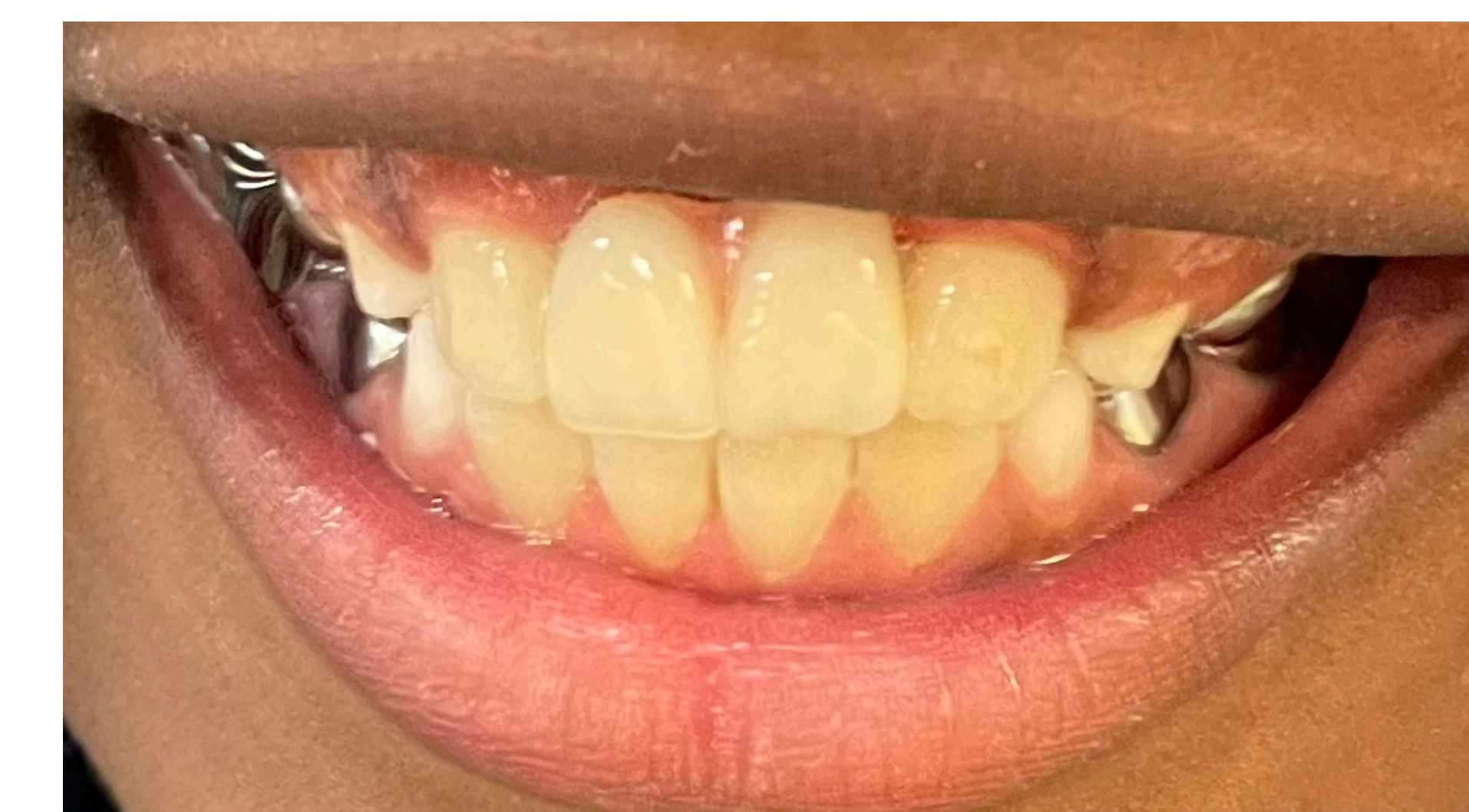


Figure E. Final Appliance

**Conclusion:** In this case, the first two avulsions resulted in teeth being extra-oral and dry for more than ninety minutes. Extended dry storage (more than a few minutes) decreases the chances of long-term survival and increases the risk of resorption and ankylosis. For this child, clinical outcomes might have been drastically different if the avulsed teeth had been replanted in a timely manner or stored in a vitality-preserving medium.

The functional and esthetic deficit that permanent anterior tooth loss causes is not trivial. Clinicians need proper training to understand how critical it is to provide timely and appropriate care for patients who have suffered an avulsion. The public should be educated on what to do for dental emergencies, including permanent tooth avulsion. With increased knowledge for patients and clinicians, delays in replantation or improper storage of avulsed teeth could be avoided and better outcomes would result.