

Replantation of an Avulsed Incisor: A Case Report

Abstract

Management of tooth avulsion in the permanent dentition often presents a challenge. Such injuries should be recognized and treated expeditiously because several studies support a more likely favorable prognosis with timely and appropriate initial management. This article describes the management of an avulsed maxillary permanent incisor that had been air-dried for about 2 hours.

Key Words

Avulsion, Replantation, Splinting, Clinical Management

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INTRODUCTION

The term "dental avulsion" describes a clinical situation in which the tooth is completely displaced out of its socket following a traumatic impact¹. Of all the dental injuries avulsion is by far the most serious because not only it severs the pulpal blood supply but it also expose the cells of the PDL to the external environment².

It accounts for 0.5% to 16% of traumatic injuries in the permanent dentition. Avulsion of permanent teeth occurs most often in children 7 to 9 yrs. old, an age when the relatively resilient alveolar bone provides only minimal resistance to extrusive forces, and maxillary central incisors are the teeth most commonly affected³. Management of avulsion of the permanent dentition often presents a challenge. If the tooth is replanted promptly with a vital PDL, functional PDL healing can occur⁴⁻¹⁰. The extraoral period significantly affects the outcome, influencing PDL vitality¹¹. Clinical studies have shown that the prognosis is best for teeth replanted within 5 minutes after avulsion¹¹⁻¹⁵.

Pulpal necrosis always occurs after an avulsion injury. While the necrotic pulp itself is of no consequence, the necrotic tissue is extremely susceptible to bacterial contamination. It revascularization does not occur or effective endodontic therapy is not carried out, the pulp space will inevitably become infected. The combination of

bacteria in the root canal and cemental damage on the external surface of the root results in an external inflammatory resorption that can be very serious and lead to the rapid loss of tooth¹⁶. Nevertheless, if managed properly, avulsed teeth with a vital PDL can be replanted and will remain functional for some years¹⁷. This article describes the management of patient with an avulsed maxillary right central incisor.

CASE REPORT

A 30 year old male presented to the Department of Conservative Dentistry and Endodontics with dental traumatic injury after falling from a two wheeler. The accident resulted in avulsion and Ellis Class I fracture of maxillary right central incisor (Fig. 1) at the time of accident.

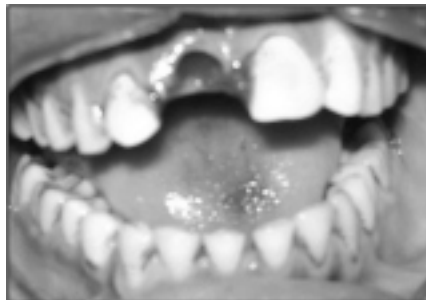


Fig 1. Preoperative View

The maxillary right central incisor found at the site of accident was stored in milk and brought to the clinic the same morning at the time of presentation. Examination of the avulsed tooth revealed that the crown and root was intact (Fig.2).

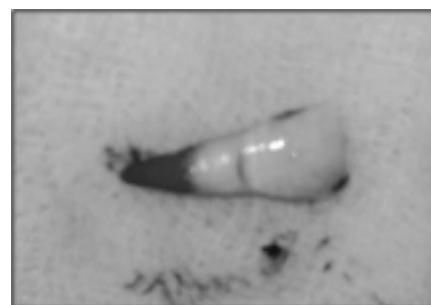


Fig 2. Avulsed 11

Radiographs and clinical examination was done to rule out any other hard tissue injury. He had no other injuries and his medical history was uneventful.

The available treatment options were explained to the patient, and it was decided to replant the avulsed incisor as an intermediate treatment. Local anesthetic was administered and the blood clot removed from the socket. The tooth was then replanted into its socket. Splinting was done with a 0.018 inches stainless steel orthodontic wire bonded to the teeth with composite (Fig. 3).

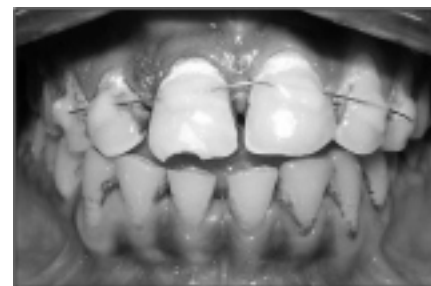


Fig 3. Splinting Done From 13 To 23

Another radiograph was obtained to confirm proper positioning of the replanted incisor. A 5 day course of Amoxicillin was prescribed, and the patient was referred to the medical practitioner for an anti-tetanus booster.

The patient was seen again at 1 week and at that time endodontic treatment was started. After 2 weeks endodontic treatment was completed (Fig.4)



Fig 4. Iopa After Root Canal Treatment

and splint was removed. Mobility of the teeth had reduced. Esthetic treatment for Ellis Class-I fracture was done with tooth colored resins.

DISCUSSION

Relative to other tooth injuries, avulsion is a more serious assault on the gingiva, the PDL and the pulp¹⁸. It has been reported that successful management of the avulsed tooth begins as soon as possible at the accident site. Extraoral time is important in determining the success of tooth replantation. Studies have shown that the prognosis of replanted teeth is best if replantation is carried out within 5 min. after avulsion¹⁹⁻²¹. In the case presented here extraoral time was less than 2 hrs, so it was anticipated that the chance of pulpal and PDL healing would be good.

Where the tooth cannot be replanted immediately the tooth should be stored in an appropriate medium such as normal saline, milk, saliva, hanks solution or water²². In this case the tooth was kept in milk. It was reported that milk is shown to maintain vitality of PDL cells for 3 hrs being relatively bacteria-free with pH and osmolality compatible with vital cells¹⁹.

Splinting is required routinely after replantation of avulsed teeth³. A splinting technique that allows physiologic movement of the tooth during healing and that is in place for a minimal time period results in a decreased incidence of ankylosis²³⁻²⁶. Semi-rigid (physiologic fixation for 7-10 days is recommended^{23, 26}. The splint should allow movement of the tooth should have no memory (so the tooth is not moved during healing) and should not impinge on the gingival and / or prevent maintenance of oral hygiene in the area. In this case splinting was done for a period of 2 weeks during which endodontic treatment was carried out. Systemic antibiotics are often recommended after replantation, but their effectiveness in preventing root resorption is questionable²⁷. To date the value of antibiotic therapy in replantation has been demonstrated only in the experimental setting^{28, 29}. Andreasen and others¹¹ in their prospective study, showed that systemic antibiotics had no effect on periodontal healing clinically.

Follow up evaluation was done at 1, 3 and 6 months after replantation. Radiographic evaluation showed no signs of external resorption (Fig.5, 6, 7, 8).

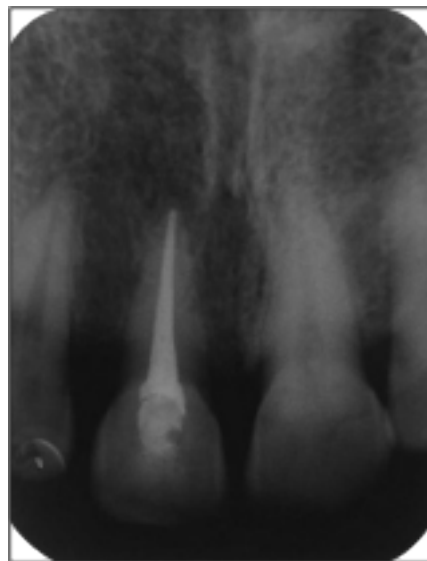


Fig 5. 1 Month Recall Radiograph



Fig 8. Postoperative View After 6 Months



Fig 6. 3 Months Recall Radiograph



Fig 7. 6 Months Recall Radiograph

CONCLUSION

Prevention and management of dental trauma should be recognized as an acute emergency. Prompt and early presentation for dental management in cases of avulsion is very important. Replantation can restore the patients esthetic appearance and occlusal function shortly after the injury, and the replanted teeth can remain functional for years.

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