

Replantation After Traumatic Avulsion of Permanent Anterior Tooth: A Case Report

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Abstract:

The aim of this case report is to present the case of replantation of a maxillary incisor with an extended extraoral period following a traumatic avulsion. After storage in saline, an extraoral endodontic treatment was performed in the avulsed tooth. The tooth was replanted back into the socket approx 3 hours later from the moment of trauma. The avulsed tooth was splinted with fibre splint after replantation. A 6 months, 24 months and 30 months follow-up and clinical examination revealed the patient to be asymptomatic and the tooth was functional. The lacerated gingiva was back to its original contour.

Key Word: *Tooth avulsion, delayed replantation, extra-oral dry time, dental trauma, IADT guidelines.*

Date of Submission: 14-09-2026

Date of Acceptance: 25-09-2026

I. Introduction

The incidence of dental trauma due to automobile accidents and violence has increased during the last decade causing anterior teeth of children and teenager to be commonly affected. The incidence is even higher in children between 8 and 12 years old due to bicycle, skateboard and sports accidents. The mean prevalence of dental and oral injuries reported in literature oscillated between 14% and 27%. In contrast, in adults the traumatic injuries are more likely related to car accidents, fights and sports.

Avulsion is known as complete displacement of tooth from the alveolus. Incidences are 1% to 16% in permanent teeth and 7% to 13% in primary teeth in school going children age. The maxillary incisors are frequently avulsed teeth while lower jaw is less affected. When a tooth is avulsed, attachment damage and pulp necrosis occurs. The tooth separated from the socket, mainly due to tearing periodontal ligament that leaves viable periodontal ligament cells on most of the root surface. In addition, due to the crushing/scraping of tooth against the socket, small localized cemental damage also occurs.

The most preferable treatment option is replantation of avulsed tooth, which can restore occlusal function and aesthetic appearance shortly after trauma. In replantation the main objective is to re-establish the vitality of periodontal fibres after treatment. The prognosis of replantation depends on the maintenance of vitality of periodontal cells on root surface. Clinical reports have indicated that the prognosis is best for teeth replanted within 5 mins. of avulsion. Extended non physiological storage of avulsed teeth before replantation results in necrosis of periodontal ligaments and consequent healing by replacement root resorption. Degeneration of PDL depends upon factors, such as extra alveolar period, storage media used and management of root. This article describes the management of mature avulsed maxillary central incisor with an extra alveolar dry storage of 3 hours. The tooth was replanted after an extra oral endodontic treatment which resulted in a good functional and aesthetic results..

II. Case Report

A 17 years old male patient came to Himalayan Dental Centre, Almora, Uttarakhand OPD with an avulsed right maxillary incisor. The avulsion was due to some sport injury in the playground. The patient arrived to the clinic after two and half hours of the trauma and carried the avulsed tooth in hand without any storage media. Tooth was immediately kept in saline as brought to the clinic. [Figure-1] Extra oral and intraoral examinations didn't reveal injury to any other sites. [Figure-2] No other facial or dental injury detected. Radiographic examination revealed to tooth remnants in the socket of avulsed tooth and no dento-alveolar fractures were detected. [Figure-3].



[Figure-1]Avulsed tooth in Sasaline

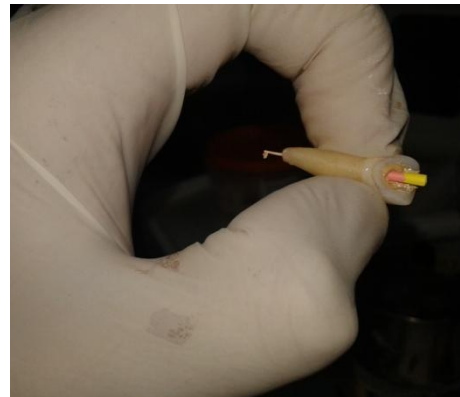


[Figure-2] Pre operative photograph showing Avulsion Of 11

An extraoral endodontic treatment was performed in the avulsed tooth[Figure-4] and was shortened about 1.5 mm from the apex.



[Figure-3]Pre Operative Radiograph showing Avulsion Of 1



[Figure-4]Extraoral endodontic treatment

Before replantation the socket was cleaned with the saline. The root surface was then conditioned with citric acid for 5 mins and then soaked in saline for 5 mins. The socket was filled with calcium hydroxide and the tooth was replanted in the socket.[Figure-5] . IOPA Radiograph taken after replantation.[Figure-6].



[Figure-5] Photograph after replantation



[Figure-6]IOPA X-Ray after replantatio

The tooth then splinted palatally to the adjacent teeth with fibre splint on palatel surface due to esthetic resion.[Figure-7] The patient was instructed to use chlorhexidine mouthwash twice daily and was placed on a soft diet. A 5 day course of systemic antibiotics was prescribed.



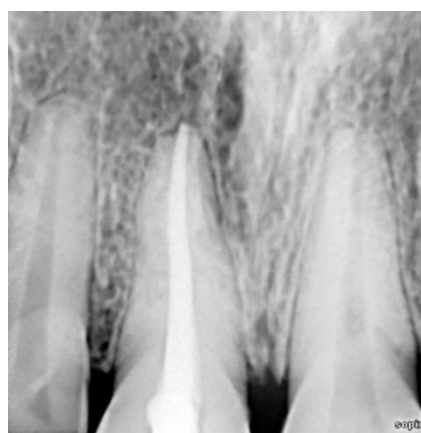
[Figure-7] Fiber splint palatelly placed



The splinting was removed 2 weeks later the replantation. Oral examination after 6-months done.[Figure-8] Radiographic and clinical examination were performed during 30- months follow up period.[Figure-9].



[Figure-8] Photograph after 6 months



[Figure-9] Radiograph after 30 months

During the follow up period, the tooth remained in a stable position and did not reveal any clinical ankylosis or replacement resorption. Both the patient and his parents were satisfied with the treatment outcome. And the boy was selected for army too.

III. Discussion

Traumatic dental injuries are emergencies that the dentist must be able to assess rapidly and manage appropriately. The prognosis of an avulsed tooth is proportional to extraoral time, which is a direct correlation of the status of periodontal cells. The determination of treatment plan is very important in case of avulsed teeth. The storage and transport media during extraoral time of vital significance.

In present case study the avulsed tooth had been in extremely unfavourable conditions till it was brought to the clinic. According to Donaldson and Kinirons extraoral dry time is the most crucial factor associated with the development of postreplantation root resorption. Andreason claimed that replacement resorption occurred if the extraoral dry time was more than 60 minutes, and no cell remained vital beyond 120 minutes of dry time on the root. As the extraoral dry time was more than 60 minutes, root canal treatment was performed outside the oral cavity. This seems to prevent inflammatory root resorption caused by pulpal infection. Root planing of the tooth was done to remove all necrotic PDL to limit the degree of surface inflammation on the root surface. Tooth was then immersed in sodium hypochlorite to dissolve connective tissue remnants. Pretreatment of a delayed replanted tooth, prior to its replanting, will render it more resistant to resorption.

Splinting technique should allow physiological movement of teeth during healing. The chances of ankylosis is decreased, if the splint is kept for a minimal period. Ankylosis of the incisors in young patients can result in infraocclusion as the patient grows. Severe infraocclusion can cause esthetic problems.

Systemic antibiotics are often recommended after replantation, but their effectiveness in preventing root resorption is questionable.

In this case, patient's esthetic and functional demands were totally met by the treatment.

IV. Conclusion

In the case of avulsed permanent teeth with prolonged extra-oral time, replantation should be the first possible treatment. Although the risk of replacement resorption and tooth loss may be highly possible. If extraoral dry time is more than 60 minutes extraoral endodontic treatment is not detrimental. If the procedure and techniques applied properly avulsed tooth can remain functional as well as esthetical for many years and minimise the need of other prosthetic restoration.

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