

CASE REPORT

Management of Avulsed Tooth With fibre Splinting- A case report

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ABSTRACT:

Background: In patients with avulsed tooth, a flexible splint allows functional movement in contrast to a rigid splint where the injured teeth are immobilized. We are presenting a case report of an eighteen year old male patient who presented with avulsed tooth and was managed with fibre splinting. The use of fibre splint after replantation of avulsed tooth allows immobilization of the teeth during the initial period, which is essential for the repair of periodontal ligament; and at the same time, yield excellent results.

Key words: Avulsed, Composite, Tooth.

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INTRODUCTION

Traumatic dental injuries compromise the patient, in both functional and psychological aspects. Among dental traumas tooth avulsion has prevalence from 0.5 to 16% in permanent dentition, and it is defined as the complete displacement of the tooth out of its socket with disruption of the fibres of periodontal ligament, remaining some of them adhered to the cementum and the rest to the alveolar bone.¹⁻³ A flexible splint allows functional movement in contrast to a rigid splint where the injured teeth are immobilized. A recent systematic review and meta analysis on autotransplanted teeth reported that the ankylosis rate was three times higher with wire and composite resin splinting when compared with suture splinting, suggesting the importance of physiological movement on healing outcomes.⁴⁻⁶ Hence; we hereby, present a case report of an eighteen year old male patient who presented with avulsed tooth and was managed with composite splinting.

CASE REPORT

An 18-year-old boy was referred to the Department of Conservative Dentistry and Endodontics [K.D. Dental College and Hospital, Mathura] with a history of trauma that resulted in broken teeth in upper right and left front region of mouth. The trauma occurred 7 hours ago while

the patient was walking across the road. No neurological or medical complaint was recorded in the emergency department and after carrying out all the necessary investigations the patient was sent to conservative department. Both the maxillary left and right central incisors were avulsed (**Figure 1**). The patient had kept the avulsed teeth in water when brought to the department (**Figure 2**).



Figure 1: Preoperative



Figure 2: Avulsed teeth

Patient confirmed the absence of any concomitant systemic disease. The intraoral examination revealed that the maxillary left and right permanent central incisor (tooth 11 and 21) was avulsed. The teeth were treated with doxycycline and were stored in stannous fluoride solution. Extra-oral root canal therapy was done in both the teeth (**Figure 3**). Left and right infra orbital block was administered. The tooth sockets were irrigated and inspected for any residual bone or foreign body. Reimplantation was done into the socket followed by application of etchant (**Figure 4**) application of bonding agent with placement of fiber splint (**Figure 5**), followed by light curing (**Figure 6**).



Figure 3: Extra-oral root canal therapy



Figure 4: Reimplantation done with etchant application



Figure 5: application of bonding agent and application of Interlig Fiber Splint (Angelus)



Figure 6: Light curing was done after placement of splint

Oral hygiene instructions were given. Patient was advice for soft diet and to use a chlorhexidine mouth rinse during the stabilization period. Antibiotic therapy was initiated for one week. The patient was also referred for an anti tetanus booster. The patient was seen again three weeks after replantation, and the fiber splint was removed at this appointment. The patient was reviewed after three months (**Figure 7**), and no clinical or radiological pathological changes were detected.



Figure 7: Postoperative 3 months

DISCUSSION

The outcome and success rate of the reimplantation depends on many factors such as status of avulsed tooth, root development stage, dryness in extra-alveolar period, storage environment, the treatment time and modality.

The guidelines for the treatment of avulsed permanent teeth vary, but the consensus is that the ideal treatment for an avulsed tooth is immediate reimplantation.^{7, 8} However, it cannot always be carried out immediately. The treatment decision regarding avulsed teeth is related to the maturity of the root apex (open or closed) and the condition of the PDL cells. The extra-oral period significantly affects the outcome and has a direct correlation with the survival of PDL cells. Clinical studies have indicated that teeth replanted within 5 minutes after avulsion have the best prognosis.⁹ After a dry time of 60 minutes or more, all PDL cells are nonviable^{7,8}. The storage and transport media during the extra-oral time are also of vital significance. In patients with a prolonged extra-oral time, the tooth should be maintained in a suitable media, such as HBSS, saline, milk, or saliva until it is replanted by a dentist

In this case, the avulsed incisors had a closed apex and were kept in water from the moment of trauma until their replantation 7 hrs later. Prolonged extra-alveolar period and closed apex are the factors that cause deficiency in pulpal and periodontal healing, so it was assumed that the prognosis of the teeth would be negligible or poor. It was aimed to prevent the tooth loss, maintain aesthetic and functional properties and minimize inflammatory root resorption when performing the treatment. The management of this case was in accordance with the accepted replantation protocol described by the International Association of Dental Traumatology.⁹ Because there were no chances of obtaining pulp space revascularization and the periodontal ligament would be necrotic and not expected to heal, it was decided to treat the root canals extraorally. The tooth was treated with doxycycline and placed in a 2.4% solution of stannous fluoride (acidulated to pH=5.5) for 20 min. The pulp was extirpated and the root canal obturated with guttapercha and a sealer. Before replantation socket was then irrigated with normal saline and tooth was replanted.

Properly replanted teeth have been shown to require splinting to prevent increased mobility. Thus, the lateral forces acting on the teeth are transformed into vertical forces. For healing, it is desirable that the traumatized socket is slightly forced and the teeth move in a controlled manner. Splinting is recommended for three weeks in cases where the root and alveolar bone are not fractured. Studies have shown that root resorption is less common in the teeth stabilized with a semi-rigid splint, whereas rigid splinting can cause ankylosis. Ribbond are the most commonly used splint types in the clinic. Ribbond fiber splint was used in this case due to its good properties of elasticity, translucency, adaptability, adherence, and resistance to traction and impact.⁷

The goal in delayed replantation is, in addition to restoring the tooth for esthetic, functional and psychological reasons, to maintain alveolar bone contour. However, the expected eventual outcome is ankylosis and resorption of the root and the tooth will be lost eventually. Despite an extended extra-alveolar dry storage time, teeth with delayed replantation might be retained in a stable and functional position in the dental arch. In patients for

whom growth has not ceased, using the replanted tooth to maintain the surrounding bone for a few years until the patient is a viable implant candidate can be considered a suitable therapeutic option. Replantation can restore the patient's esthetic appearance and occlusal function and prevent physiological trauma, which may be associated with a missing anterior tooth.¹⁰

CONCLUSION

Under the light of above mentioned data, the authors conclude that the use of fiber splint after reimplantation of avulsed tooth allows immobilization of the teeth during the initial period, which is essential for the repair of periodontal ligament; and at the same time, yield excellent results.

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