

## CASE REPORT

## DELAYED REPLANTATION OF AVULSED TOOTH WITH 22 HOURS DRY TIME: FOUR YEARS FOLLOW-UP OF A VIABLE TREATMENT MODALITY

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Avulsion is the complete displacement of tooth out of its socket. It is the gravest form of dental traumatic injury which accounts for 0.5–3% of the total dental traumatic injuries of the permanent teeth and most commonly involves the maxillary central incisors. The treatment is immediate tooth replantation or if that is not possible then storing tooth in an appropriate storage medium and attending dental clinic at the earliest. The present case report describes the replantation of maxillary left central incisor tooth that was avulsed. The tooth was out of the socket for 22 hours without any storage medium. Tooth was replanted after the removal of non-viable periodontal tissues; splinting was done for 4 weeks and endodontic treatment was initiated after 7 days. The tooth was stable and functional with mild discoloration and ankyloses at four years follow up, which is considered a desirable treatment outcome after delayed replantation.

**Keywords:** Delayed Replantation; Tooth Avulsion; Tooth Ankylosis

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### INTRODUCTION

The avulsion is a severe form of dental traumatic injury where the tooth is wholly knocked out of the alveolar socket. The incidence of avulsion ranges from 0.5–3% of all the dental traumatic injuries of the permanent teeth.<sup>1,2</sup> Tooth avulsion most commonly involves maxillary central incisors.<sup>3</sup> Young children aged between 7–9 years are commonly affected as a result of incomplete root formation and the inability of periodontal ligament (PDL) to resist extrusive forces.<sup>1,2</sup> The best treatment for an avulsed tooth is immediate replantation. However, it is sometimes not possible and the tooth is recommended to be stored in a medium to protect the PDL from drying out.<sup>2,4</sup> The favourable outcome of the treatment depends upon the tooth or root maturity, type of storage medium, and extraoral dry time.<sup>5</sup> Andersson identified thirty minutes as the cut-off time for chances of optimum healing of PDL. Nevertheless, the tooth is advised to be replanted as tooth retention for a few more years will maintain alveolar bone in children and adolescents.<sup>1</sup>

The present case report describes the delayed replantation of maxillary left central incisor with an extraoral period of 22 hours.

### CASE REPORT

A twelve-year old child presented to the Department of Operative Dentistry at Riphah International University, Pakistan with avulsed maxillary left central incisor tooth (tooth#21). The accident took place as a result of the fall at the school on the previous day.

The medical history was insignificant and the patient was up to date with tetanus immunization. There were

no signs of head injury. The extra-oral examination was unremarkable. The intraoral examination showed late mixed dentition, with the crowding in the mandibular anterior sextant. The patient had a class 1 molar relationship with the incisal overbite of 8mm and incisal overjet of 5 mm; the oral hygiene was fair. Tooth number 21 was avulsed (Figure-1d). The pulp vitality test was positive for the adjacent teeth. The parents brought the tooth after 22 hours of the incident in a tissue paper (Figure-1a). On examination, the tooth was in one piece with closed apex. Subsequently, intraoral periapical radiographs were taken to rule out fractures of the alveolar socket and traumatic injuries to the adjacent teeth (Figure-1b). The socket of tooth 21 was normal. Immediate replantation of the tooth was planned. Parents were informed about the treatment options, risks, prognosis, and consent was taken.

Local infiltration anaesthesia of 2% Lidocaine with 1:100,000 epinephrine was administered. The tooth socket was rinsed with saline. The debris was gently removed from the root surface by the wet gauze piece. Subsequently, the tooth was immersed in the 2% sodium fluoride (2% NaF) solution for 20 minutes and just before replantation, the tooth was placed in dexamethasone solution. The replantation of the tooth was carried out carefully with minimal apical digital pressure. The verification of the correct positioning of the replanted tooth was done clinically and radiographically. The tooth was splinted for four weeks with the adjacent teeth by using a flexible wire (round twist-flex archwires, 3M Unitek, USA) and the light-cured composite resin (Figure-1c and 1e). The patient was prescribed Capsule Amoxicillin 500mg three times

a day for 5 days with analgesics for pain relief. Oral hygiene instructions and soft diet advice were given.

Subsequently, after 7 days root canal preparation was done and corticosteroid antibiotic paste (Ledermix) was placed as an intracanal medicament for 3 weeks. Glass ionomer cement with the cotton pellet was utilized as a temporary restoration. After three weeks obturation was done with the gutta-percha, tooth was restored with the composite resin restoration and the splint was removed. The patient was recalled after 3

months, 6 months, and 9 months. A periapical radiograph was taken after 6 months of replantation (Figure-2a). On follow up after four years, tooth was clinically stable with no mobility, however, discoloration of the crown and the minimal labial gingival recession was seen (Figure-2c). Radiographically, ankylosis was seen with replacement resorption of the root (Figures-2b) and the percussion sound was dull.



**Figure-1: (a) Avulsed Maxillary Central Incisor in a tissue paper (b) Periapical radiograph before replantation (c) Periapical radiograph a week after replantation and splinting (d) Clinical presentation at the time of reporting (e) Clinical picture after splinting**



**Figure-2: (a) Radiograph after 6 months of replantation (b) Radiograph on 4 years follow up showing ankylosis (c) Clinical presentation on 4 years follow up showing minimal gingival recession and discoloration in relation to tooth# 21**

## DISCUSSION

The most common outcome of tooth avulsion is the necrosis of pulp and external root resorption. The outcome becomes unfavourable as the extraoral dry time exceeds 60 mins.<sup>1</sup> In the present case extra-oral dry time was 22 hours and PDL was not expected to survive so the goal was to delay the inflammatory and osseous replacement resorption by removing the necrotic PDL.<sup>6</sup> Therefore, the root surface was cleaned by wet gauze piece and treated with 2% sodium fluoride to slow down the progression of the osseous replacement of the tooth.<sup>2</sup> Before replantation, the tooth was placed in dexamethasone solution to improve healing and minimize the rate of root resorption.<sup>7,8</sup> Subsequently, the tooth was replanted and stabilized by utilizing a semi-rigid splinting technique for four weeks that allowed the tooth to have physiological movement.<sup>1,9</sup> The endodontic treatment was initiated after 7 days and after canal preparation, Ledermix paste (1% triamcinolone acetonide and demeclocycline) was administered in the canal for three weeks. The demeclocycline is an antibiotic that inhibits bacterial ribosomal protein synthesis and triamcinolone is a corticosteroid that diffuses through the dentin and inhibits the external inflammatory root resorption by inhibiting the activity of dentinoclasts.<sup>10</sup>

The long-term prognosis of an avulsed tooth with extended extraoral dry time is poor.<sup>1-3</sup> In the present case report since the patient was young and his facial growth was yet to be completed. The main goal was to maintain the bone level, space in the arch, occlusion, and to prevent the psychological trauma to the child. Tooth discoloration with minimal labial gum recession and ankylosis were noted on four years follow up which is considered as a desirable treatment outcome in a growing child after delayed replantation.<sup>1</sup> The bone levels were maintained and implant or fixed partial denture can be placed in the future when the child completes his growth. Replantation of the avulsed anterior tooth

after prolonged dry time is viable treatment modality for the children in the growing stage. It helps in the maintenance of aesthetics, tooth space and bone levels for the future provision of long-term prosthetic options.

**Patient's Consent:** Informed consent was taken from the patient.

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