

## Case Report

# Re-implantation and 8 months follow-up of the avulsed maxillary central incisors with 5 days of extra-oral dry time: A Clinical Case Report

Parth Shah<sup>1</sup>, Shoeb Mujawar<sup>2</sup>

<sup>1</sup> P.G. Student, Department of Pediatric and Preventive Dentistry, ACPM Dental College, Dhule, Maharashtra, India

<sup>2</sup> Senior Lecturer, Department of Pediatric and Preventive Dentistry, ACPM Dental College, Dhule, Maharashtra, India

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### ABSTRACT

The frequency of tooth avulsion following traumatic injuries ranges from 0.5 to 16% in the permanent dentition and from 7 to 13% in the primary dentition. Resorption is the main cause of failure of re-implantation. This is the case report of the replantation of the two avulsed permanent maxillary central incisors (11, 21) with the extra-oral dry time of 5 days, and regular follow up for 8 months.

### Introduction

Avulsion is the loss of tissue. Dental avulsion is the complete displacement of a tooth out of its socket.<sup>1</sup> The frequency of tooth avulsion following traumatic injuries ranges from 0.5 to 16% in the permanent dentition and from 7 to 13% in the primary dentition.<sup>2</sup> Variety of treatment options available for such dental injury depending upon time elapsed since injury, storage media, extra-oral dry time and integrity of tooth and supporting bone.

The success of tooth re-implantation depends on the maintenance of vitality of the periodontal ligament, allowing its remnants adhered to the avulsed tooth to survive and recover their function. Resorption is the main cause of failure of re-implantation, and the prognosis of a replanted tooth is related to the type of resorption that may ultimately lead to complete destruction of the root. The need to perform endodontic

treatment has been demonstrated by several authors, as the pulp tissue may present necrosis and its toxins may

reach the periodontal ligament through the dentinal tubules or apical foramen, definitely contributing to an increase in the resorption process.<sup>3-4</sup>

### Case Report

On the morning of 17<sup>th</sup> April, 2014, an 11-year-old female patient reported to the Department of Pedodontics and Preventive Dentistry at A.C.P.M Dental College, Dhule with avulsion of her maxillary right and left central incisors. She got trauma to the maxillary front region teeth when she fell on the stone while riding the bicycle on 12<sup>th</sup> April, 2014. Her parents brought both the avulsed teeth with them, they were intact and were kept dry in a piece of newspaper after the injury.

We found no significant medical and dental history. On radiological examination, Periapical radiography revealed no other hard tissue injury. Alveolar socket and

\* Corresponding author. Dr. Parth Shah, P.G. Student, Department of Pediatric and Preventive Dentistry, ACPM Dental College, Dhule Address: Room No. 29, Boys' Hostel, ACPM Dental College, Dhule Mobile No. - +91 9665549388 E-Mail – shahparthhemant@gmail.com

bone were intact. No evidence of fracture was found. [Fig. 1] Hence, Re-implantation of the teeth was planned to retain the teeth in the oral cavity for as long period as possible. As this was the case of delayed re-implantation, intentional curettage of the alveolar socket and endodontic treatment were necessary.

First of all, the teeth were cleaned with saline and betadine and dead PDL fibres were removed and teeth placed in Minocycline solution for 20 minutes. After this, access opening was done extra-orally with both teeth with No. 330 round bur and high speed arotor. And necrotic pulp was extirpated. Copious Irrigation was done with normal saline and Intracanal medicament was placed in both central incisors containing combination of antimicrobial and corticosteroids and temporary dressing was given. Then teeth were placed in 2.4% solution of sodium fluoride for 20 minutes. Both empty sockets started healing process within them, so both teeth were not fitting satisfactorily in their respective sockets. Hence, sockets were gently cleaned with the universal curette to remove coagulum and to induce fresh bleeding [Fig. 2] and teeth were again placed in their respective sockets. This time, teeth were fitted satisfactorily in their respective positions. Then, the incisors were re-implanted into their respective sockets and checked for alignment and occlusion and were splinted to the adjacent teeth, from canine to canine, with 19 gauge Stainless Steel hard round wire and composite. Periapical and occlusal radiographs were obtained to confirm proper positioning of the replanted teeth. [Fig. 3] Patient was given the tetanus prophylaxis suspecting the dust contamination of avulsed teeth and placed on systemic antibiotic coverage and discharged with dietary precautions and oral hygiene instructions. Patient was recalled after 1 week after initial stabilization of teeth.

After 1 week, temporary dressing was removed and thorough irrigation done with saline + 5.2% hypochlorite. And same Intracanal medicament of calcium hydroxide + prednisolone was placed again in both teeth and temporary restorations were given. This was done to prevent the initial resorption process of the re-implanted teeth. This medicament was changed every week for 3 weeks and then both teeth were assessed radiographically again.

After 4 weeks of re-implantation and splinting, when patient was totally asymptomatic, splinting was removed. Re-implanted teeth were effectively stabilized. No clinical or radiographic complications were observed, hence obturation of both teeth was planned after this 3 weeks of follow-up period. Temporary restorations were removed and thorough irrigation done to remove Intracanal medicaments. Working length was determined and bio-mechanical preparations were done with conventional hand k-files with both central incisors up to file no. 45 apically and file no.60 coronally under copious irrigation of saline and hypochlorite. This was followed by application of resin-based canal sealants and obturation done with 2% gutta percha points with lateral condensation technique. [Fig. 4] Permanent Composite restorations were done with both teeth after obturation. Patient was kept under observation.

Regular follow-up done for every week for the first month, every 15 days for second month, and then monthly for 8 months after the trauma. Both Radiographic and clinical examination carried out and evaluated for every follow-up. [Fig. 5]

#### **Discussion:**

Young permanent tooth loss leads to severe arrest of alveolar bone formation in growing child. Alveolar ridge would be narrow and difficult to restore in future with

either a bridge or implant. Most conservative approach for managing the avulsed incisors is to replant them as

soon as possible. In clinical studies, teeth replanted within 5 minutes after avulsion had the best prognosis



Figure 1



Figure 3



Figure 4



Figure 6



Figure 2



Figure 5

Fig 1 – Intraoral Periapical Radiograph of Empty Sockets of 11, 21 after Avulsion

Fig 2 – Intentional Curettage of Socket of 11, 21 before replantation to remove the coagulum

Fig 3 – Intraoral Periapical Radiograph of 11, 21 immediately after replantation and splinting

Fig 4 – Intraoral Periapical Radiograph of 11, 21 immediately after obturation

Fig 5 – Clinical Photograph of Replanted 11, 21 after 8 months

Fig 6 – Follow up radiograph after 8 months

And the chance of pulpal and periodontal healing was inversely related to the period of dry storage<sup>4</sup>. In this case report, avulsed teeth were kept in a non-physiological media in dry environment for longer period of 5 days by parents. It was understood that periodontal ligament fibres were non-viable and ankylosis will be the best possible result to achieve. Re-implantation of the avulsed teeth was decided in the patient, in spite of extremely unfavourable conditions like dry storage and prolonged extraoral time, to retain the avulsed incisors in best aesthetic and occlusal form in oral cavity. Future aim was to achieve periodontal and osseous healing with replacement root resorption. The avulsed teeth were splinted to the adjacent teeth with

rigid wire for 4 weeks to facilitate rapid ankylosis. Ebeleseder et al. suggested that replanting avulsed teeth should be considered as a temporary solution in children and adolescents.<sup>5</sup> In this patient, most expected benefit of re-implantation of avulsed teeth is preservation of alveolar bone. Even if the replanted tooth needs to be extracted later, the maintained alveolar dimension will provide better options for permanent restoration of that site later. We have achieved some immediate benefits like rehabilitation of aesthetics and occlusal function, delay in inflammatory resorption process and preservation of alveolar bone height for better permanent treatment considerations in later life. Patient is totally asymptomatic and satisfied with the treatment after the follow-up of 8 months. This treatment gave priceless contribution in the normal physiological growth of the dento-facial structures of the patient.

Importance of this case report in pediatric dentistry:

- This case report will show new horizon in the management of traumatic injuries.

- This article guides about conservative approach even after all unfavourable conditions.
- This article includes some new medicament combination as an intracanal dressing which will help in preventing the resorption and infection after re-implantation of tooth in trauma case.

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