

# Delayed Replantation of Avulsed Maxillary Anterior Tooth – A Case Report

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| Received: 10.02.2019 | Accepted: 20.02.2019 | Published: 27.02.2019

DOI: [10.21276/sjodr.2019.4.2.7](https://doi.org/10.21276/sjodr.2019.4.2.7)

## Abstract

Replantation of the avulsed tooth immediately is the ideal emergency management. Accounting for about 0.5-16% of injuries caused by trauma in the permanent dentition creates a strenuous situation for the patient and dentist. Its prevalence is more common in children with maximum cases occurring in ages between 7 to 9 years old, when the development of root is incomplete and also the maxillary central incisors are the most common site involved, thus creating a negative psychological impact on the child as well as the parent owing to esthetic reasons. Therefore, esthetics and function of the avulsed tooth can be restored by immediate or delayed replantation. In the present case report we will discuss the management of an avulsed tooth in a 21 years male patient in maxillary anterior region.

In this case after 18 months, replantation of avulsed tooth was successfully achieved even it has to be replanted in unfavorable conditions. The tooth was asymptomatic, firm and radiographically no signs of resorption or infection were observed.

**Keywords:** Avulsion, replantation, trauma.

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## INTRODUCTION

Avulsion following trauma is a serious injury that damages the dental and supportive tissues [1]. It can also lead to concomitant damage the tooth itself or the alveolus. Accounting for about 0.5-16% of injuries caused by trauma in the permanent dentition creates a strenuous situation for the patient and dentist [2]. Its prevalence is more common in children with maximum cases occurring in ages between 7 to 9 years old, when the development of root is incomplete and only minimal resistance to extrusive forces is provided by the relatively resilient alveolar bone, affecting the maxillary central incisors most commonly creating a negative psychological impact on the child as well as the parent owing to esthetic reasons [3]. Therefore, esthetics and function of the avulsed tooth can be restored by immediate replantation which has been dictated as 5 mins in clinical studies and found to have the best prognosis. Replantation of the avulsed tooth immediately is the ideal emergency management, but the replantation performed in 20-30 min after the trauma or storing the tooth in an appropriate storage media until the patient can be seen by a dentist is also feasible [4]. As soon as the tooth is out of the socket, the cells of the pulp and of the periodontal ligament begins to deteriorate. This is due to the effects of lack of

blood supply to the PDL cells, and environmental factors (e.g. drying or bacterial contamination). Hence, the prognosis of an avulsed tooth depends upon the extraoral time, which is a directly correlated to the status of the PDL cells.

## CASE REPORT

A 21 year old male patient reported to the department of Conservative Dentistry and Endodontics at Saraswati Dental College, Lucknow, India with the chief complaint of avulsed upper anterior tooth following an accident (Figure -1). The trauma occurred 24 hours before and the avulsed tooth was kept dry in plastic container. Examination of the tooth revealed closed root apex and the root surface was covered with dried remnants of periodontal tissues (Figure -2). Patient's medical history was unremarkable. Radiological examination revealed empty socket and clinical examination revealed blood clot in the socket. No other hard tissue injury and no fractures were detected. The available treatment modality was explained to the patient and it was decided to replant the avulsed tooth as an intermediate treatment. The avulsed tooth was thoroughly cleaned using normal saline. The avulsed tooth was then soaked in 1.23% APF solution for 20 minutes prior to replantation. Access opening

along with biomechanical preparation and obturation was done extraorally. The access cavity was sealed with glass ionomer cement and 3mm of root resection was done and the retrograde filling was done with Biodentine. The avulsed tooth was then immersed in doxycycline for 20 minutes prior to replantation. Under local anaesthesia, the socket was gently curettaged to remove any coagulum or foreign body and irrigated with saline before replantation. Fresh bleeding was induced and the avulsed tooth was then positioned, labial and palatal cortical plates were compressed for approximation. Circumferential suture was given to secure the avulsed tooth and flexible splinting was done from canine to canine using ligature wire and composite

(Figure – 3 to 6). Antibiotic and anti-inflammatory medications were prescribed for 7 days. The patient was instructed to not to bite from anterior teeth and remain on soft diet for 2 weeks. Oral hygiene instructions were given. Suture was removed after 5 days and was examined for uneventful healing. Patient was recalled after 2 weeks, since the tooth was not firm, it was decided to continue the splint for 2 weeks more. After 2 weeks, there were no sign and symptoms of mobility or resorption, thus the splint was removed. Patient was kept on regular follow up for every 6 months. The clinical picture and IOPA X-ray after 1.5 years shows no pathologic changes in the replanted site (Figure – 7 and 8).



**Fig-1: Preoperative**



**Fig-2: Avulsed Tooth**



**Fig-3: After Replantation**



**Fig-4: Immediate IOPA X-ray**



**Fig-5: Post-operative**



**Fig-6: 3 months follow-up IOPA X-ray**



**Fig-7: 1.5 year post-operative**



**Fig-8:1.5 year follow-up IOPA X-ray**

## DISCUSSION

Replantation of an avulsed tooth is a successful management when the PDL cells are still viable. Storage medium in which the avulsed tooth is kept and management of the tooth before replantation also has a critical effect on the status of PDL cells. Prolonged storage of avulsed teeth in a non-physiological condition, before replantation results in complete necrosis of the PDL leading to external root resorption which is a perennial complication after replantation of teeth [3]. Different varieties of external root resorption that can occur as a consequence of delayed replantation are: surface resorption, inflammatory resorption and replacement resorption.[5] Progressive forms of inflammatory and replacement root resorption is notable causes of tooth loss for replanted teeth [6]. Both inflammatory resorption and replacement resorption may be diagnosed in 2 – 6 months of replantation. If resorption is not detected within 2 years, risk of resorption is reduced [7]. Replacement root resorption which is a frequent outcome, in course of growth will ultimately lead to ankylosis. Infraocclusion occurs as a result of ankylosis of the teeth in young patients because of growth. Properly managed avulsed teeth can be replanted to maintain form and function. Thus the tooth replantation procedure can either be successful or it will contribute to the normal development of the jaw in the growing patients as time is gained to establish a definitive

treatment plan for the patient, when growth is completed [8].

Immediate replantation of the avulsed tooth is widely accepted as the most appropriate treatment, however this may not always be possible. In the present case, the patient reported to us within 24 hours after the trauma. Even if the treatment is delayed, replantation of the avulsed tooth should be attempted first considering the benefits of esthetics, form of function that might result from the treatment.

Since the avulsed incisor had been air dried for a prolonged period thus it was anticipated that the chance of pulpal and periodontal healing would be low. The prognosis is directly related to the severity and surface areas of inflammation on root surface.

After treatment planning the tooth was immersed in Doxycycline for 20 minutes before extraoral filling and replantation, because of its antimicrobial effect and conditioning of the root causing exposure of the collagen fibers on the root cementum and promotes a contact surface for reattachment of the periodontal collagen fibers. Endodontic treatment was carried out extraorally in order to improve the chance of retention and prevent replacement resorption [9]. The tooth was then soaked in 1.23 % acidulated phosphate fluoride solution (pH -

5.5) for 20 minutes prior to replantation to treat the root surface assuming that the demineralized dentin would be more prone to the fluoride incorporation and might become resistant to resorption. Fluoride directly acts on bone tissues, cementum and dentin by converting hydroxyapatite into fluorapatite. The avulsed tooth was repositioned in the socket with firm pressure and was splinted using ligature wire. Splinting allows physiologic movement of the tooth thus reducing the incidence of ankylosis and allows for stimulation of periodontal ligament during healing when periodontal ligaments were not necrotic [10]. According to IADT (International Association for Dental Traumatology) guidelines, splinting time of 4 weeks is generally recommended in case of tooth replanted after 60 minutes.

In our case after 18 months, tooth was asymptomatic, firm and radiographically no signs of resorption or infection were observed. The presence of intact laminadura suggested favourable healing response.

## CONCLUSION

Replantation ensures adequate space maintenance in the arch, aesthetic function, and prevents psychological trauma, which may be associated with a missing anterior tooth. It can be concluded that with proper diagnosis and prompt treatment the objectives of replantation of avulsed tooth can be successfully achieved even if it has to be replanted in unfavorable conditions.

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