

## REPLANTATION OF AN AVULSED TOOTH AFTER PROLONGED DRY STORAGE- A CASE REPORT

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### Abstract

Traumatic injuries to permanent teeth include coronal and root fractures, luxations, subluxations, and avulsions. The most common complications after avulsions are necrosis of the pulp and root resorption. Treatment is often compound, time consuming, overpriced and requires multidisciplinary approaches such as endodontic and periodontal treatments, orthodontic movements, surgery as well as aesthetic coronal restoration. Replantation of the avulsed tooth can restore aesthetic appearance and occlusal function shortly after the injury. This case report recounts the management of a patient with an avulsed mandibular permanent incisor that had been re-implanted after an extensive extra oral dry storage time of 11 days.

**Key-words:** avulsion, storage time, extra oral dry time, replacement root resorption.

**Key message:** Replantation of avulsed tooth with extended extra oral dry period and storage under non physiologic conditions can lead to root resorption by time but it restores the aesthetics, occlusal function, physiology of the arch and promotes the growth of alveolar crest.

### Introduction

Tooth avulsion is the total displacement of tooth out of alveolar socket due to trauma. It is mainly seen in children at the age of seven - nine years when the alveolar bone is resilient. The most commonly affected tooth is maxillary central incisor. The management and prognosis of avulsion of a permanent tooth depends upon the measures taken immediately after avulsion.<sup>1</sup> Delayed replantation can affect the prognosis of the tooth.<sup>2</sup> Nonetheless replantation is important as it restores aesthetic appearance and tooth can remain functional for few years. This report highlights on replantation of tooth with extended extra oral time.

### Case Report

A 13 year old boy reported to the Department of Paediatric and Preventive Dentistry with a chief complaint of missing tooth in lower left front region of jaw. He had tied a thread to the tooth and extracted it on his own 11 days back. Patient's medical history was not relevant. The tooth was in dry condition and wrapped in a piece of cloth. Examination of the avulsed tooth revealed an intact crown with a closed apex and dried remnants of periodontal ligament due to extensive extra-oral dry storage of 11 days. On examination

missing mandibular left central incisor with healing socket, normal occlusion and fair oral hygiene was seen. Before replanting the tooth, the available treatment options and outcome were explained to the parents and replantation of the avulsed incisors was planned. Informed consent was obtained from parents. The root of the avulsed tooth was scraped gently to remove the necrotic periodontal tissue and extra oral endodontic procedure was carried out and access sealed with composite restoration. The solution of 1mg of doxycycline in 20ml of saline was prepared and the tooth was immersed into it for five minutes. A 2.4 % NaF solution was coated on the root surface for another 20 minutes. The socket was carefully curetted under local anaesthesia to remove granulation tissue and irrigated using betadine and normal saline. Fresh bleeding was induced before replantation. CaOH powder mixed with normal saline was applied on the apex of the avulsed tooth and it was replanted using digital pressure following which occlusion was evaluated and a post insertion an intra-oral peri-apical radiograph was done. Light wire splinting was done with acid etch composite resin for stabilization of mandibular left central incisor.



Figure 1: Pre-operative view - Avulsed mandibular left central incisor



Figure 2: Replantation under local anaesthesia

Proper oral hygiene instructions were given to the patient and parents and also two percent chlorhexidine mouthwash and systemic antibiotics were prescribed.

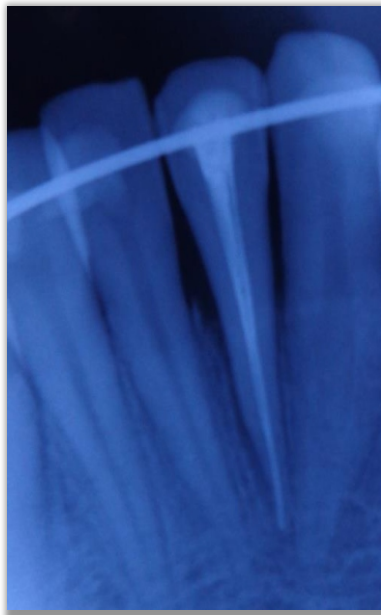


Figure 3: Post insertion radiograph

Recall after 48 hours was satisfactory. The splinting was removed after three weeks with no post-operative clinical and radiographic complications. Patient was recalled and follow up was done at one, six, 20 months.



Figure 4: Post insertion radiograph

At the time of writing, the patient had been followed for 20 months. During follow up the tooth did not show any

clinical symptoms like tenderness on percussion, mobility, periodontal pockets, colour change following which patient was satisfied. The replanted incisor developed mild replacement root resorption. However, it remained functional and was aesthetically acceptable with ideal alveolar bone height. After replantation procedure patient and parents were educated regarding importance of good oral hygiene. During each follow up appointment patient was evaluated for mobility, tenderness of replanted tooth, oral hygiene and new carious lesion if any.

### Discussion

Of all the dental traumatic injuries tooth avulsion is the most serious. Avulsions occur very often in the anterior teeth of young patients, compromising their aesthetic, mechanical and biological functions. Replantation is the first choice of treatment for avulsions under clinical conditions. In the present case, as the patient was very young and missing anterior teeth can have a negative effect on physical attractiveness, and other prosthetic solutions were not found to be suitable, therefore the decision of replantation of avulsed tooth was made. Interaction of numerous factors determine the success of treatment, such as; intensity of the trauma, vitality of the periodontal ligament, type and time of injury, solutions used for tooth storage in the extra-alveolar period, time elapsed between the avulsion and replantation, maintenance of pulp vitality, preparation of the tooth and alveolus for replantation, opportunity for endodontic treatment.<sup>3</sup> Association of Dental Traumatology (IADT) 2007 state that replantation of avulsed permanent tooth with extra-oral time more than 60 minutes is not indicated.<sup>4</sup> If the tooth remained dry for more than 60 minutes no consideration should be given to preserve the periodontal ligament and endodontic therapy should be performed extra-orally.<sup>5,6</sup> In this case extra-oral dry time was of 11 days. Cobankara and Ungor in 2007 stated that due to prolong extra oral dry time there will be the presence of blood clot and necrotic debris within the socket, which may prevent the complete insertion of the tooth into the socket. Therefore, before replantation resection of the root apex should be carried out.<sup>7</sup> The socket was curetted and irrigated using betadine and normal saline in the present case. A long term success of the treatment is related to the condition of the socket. It is recommended to rinse the socket with sterile saline.<sup>8</sup> Treatment of root surface after removal of necrotic periodontal ligament with various chemical agents such as tetracycline, doxycycline or 2.4% acidulated sodium fluoride solution (pH 5.5) for 20 minutes has been recommended to slow down the root resorption.<sup>5</sup> In this case the avulsed tooth was treated with one milligram of doxycycline in 20ml of saline for five minutes to slow down the resorption process. The most common frequent consequence of replanted tooth is root resorption. Root resorption can be classified as: surface resorption, inflammatory resorption, resorption by substitution or dento-alveolar ankylosis, internal resorption, and invasive resorption. The mechanism of action of

resorption involves the principal cells of the resorption bone tissue: osteoclasts and osteocytes, besides macrophages and monocytes, where as the odontoclasts are responsible for root resorption.<sup>[3]</sup> Kinirons et al. studied that the risk of resorption increases dramatically after five minutes of dryness, with the probability of resorption increasing by 29% for every additional ten minutes of dryness.<sup>[9]</sup> The replanted tooth should be splinted flexibly to the adjacent teeth for seven to ten days to enhance periodontal healing. If the tooth apex is closed prophylactic root canal treatment should be carried out on the day of splint removal to prevent the onset of inflammatory root resorption.<sup>[10]</sup> Semi-rigid fixation is recommended for one-ten days.<sup>[11]</sup> Systemic antibiotics are recommended after replantation to prevent bacterial invasion, thereby avoiding inflammatory resorption.<sup>[12]</sup>

### Conclusion

From the above case report it can be concluded that long term success of avulsed teeth can be obtained in cases only if they are kept under wet conditions and replanted immediately or within one hour to prevent further ankylosis or root resorption. In the above case the avulsed tooth was stored under extended extra oral dry time of 11 days. After replantation the functional integrity of the tooth, arch and aesthetics of patient were maintained. But it may eventually lead to resorption of the root by time.

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