

CASE REPORT



## The enigma behind complete external replacement resorption of replanted permanent incisor - A case report

S. Sneha, Anupama Kalappanavar, Rajeshwari G. Annigeri

Department of Oral Medicine and Radiology, College of Dental Sciences, Davangere, Karnataka, India

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### Correspondence:

Dr. S. Sneha, Department of Oral Medicine and Radiology, College of Dental Sciences, Davangere, Karnataka, India.  
E-mail: drsnehasathish@gmail.com

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### Abstract

Traumatic injuries to the anterior teeth are common among the younger individuals which may lead to undesirable sequelae like resorption resulting in loss of the tooth. As this age group is in a phase of constant growth, it becomes pivotal to save the tooth and surrounding bone until the facial growth is completed. Besides, it is crucial in preventing the psychological impact resulting from loss of the anterior tooth. Hence, to confront this challenging situation, awareness regarding the need for timely management needs to be disseminated among the public in addition to paying heed to the guidelines for the management of traumatic tooth by the dentist.

### Introduction

Traumatic injuries to the teeth are a frequent finding in the dental practice commonly seen in preadolescence and adolescence age group. Avulsion of permanent teeth is one of the serious dental injuries accounting for 0.5–3% of all traumatic injuries.<sup>[1]</sup> It results in the damage of the periodontal ligament (PDL) causing the PDL cells to become viable, thereby leading to competitive healing which is characterized by healing from the socket wall (creating bone through bone marrow-derived cells) and healing from adjacent PDL (creating cementum and Sharpey's fibers). Depending on the severity of the injury, transient or permanent ankylosis can occur which triggers the bone remodeling system, leading to the recruitment of osteoclasts resulting in resorption. Subsequently, osteoblasts replace the resorbed areas of the root with bone.<sup>[2]</sup> A case of complete external replacement resorption following trauma is described in the following section with possible etiologic factors.

### Case Report

A 16-year-old male patient reported to the department of oral medicine and radiology with a chief complaint of pain in the upper front tooth for 1 week. On eliciting the history, the patient had sustained trauma to the upper front teeth region 5 years back following self-fall, resulting in avulsion of the upper right maxillary central incisor. The patient had reportedly placed

the avulsed tooth in milk an hour after the trauma and visited a dental clinic approximately 15 h later where the tooth was root canal treated before replanting followed by splinting for a week.

Intraoral examination revealed discolored upper right central incisor which was intruded compared with the adjacent teeth [Figure 1]. The tooth was tender on percussion along with the presence of vestibular tenderness. There was no response noted with electric pulp tester with respect to 21 and 22. Intraoral periapical radiograph was taken for the area of interest, which revealed apical migration of the crown which was displaced distally along with diffuse radiolucency in the cervical aspect. There was a complete loss of root structure with evidence of radiopaque obturation material [Figure 2].

Hence, based on the patient's history, clinical and radiographic examinations, complete external replacement resorption with respect to 21 was considered. The tooth was extracted under local anesthesia followed by prosthetic rehabilitation.

### Discussion

Resorption of the roots is classified as internal or external on the basis of the surface of the tooth being resorbed. In external resorption, odontoclasts resorb the outer surface of the tooth. The reimplantation or transplantation of teeth almost invariably results in severe resorption of the root.<sup>[3,4]</sup> Studies have reported that mature replanted teeth had a 5-year survival rate of 92.2%.<sup>[5]</sup>



**Figure 1:** Discolored 21 intruded in comparison with the adjacent teeth



**Figure 2:** Intraoral periapical radiograph revealing complete loss of root structure with respect to root canal treated 21

Various factors influencing the prognosis of replanted teeth are the extraoral dry time, transport media, the stage of root development (open/closed apex), the extent of damage to root surface, and surrounding structures. The extraoral dry time may contribute significantly to the severity of the resorption as an extraoral time of longer than 60 min makes the PDL cells non-viable, thereby compromising the protective mechanisms.<sup>[1,6]</sup> As seen in this case, there was an initial delay of approximately 1 h in placing the tooth in milk added by storage for approximately 15 h. Milk as a storage media is shown to preserve the PDL cells for up to 8 h;<sup>[7]</sup> however, in the present case, longer period of storage in milk could have been one of the factors leading to resorption. Furthermore, the root canal treatment that was performed before replantation prolonged the extraoral dry time further. As per the International Association for Dental Traumatology guidelines<sup>[1]</sup> for the management of avulsion, a tooth with closed apex and

with an extraoral dry time longer than 60 min has to be stabilized for 4 weeks using a flexible splint, which was not followed in the present case, thereby increasing the likelihood of resorption. Finally, the improper position of the tooth in the socket as seen clinically and radiographically is another contributing factor for the extent of resorption, which is in accordance with previous literature,<sup>[8]</sup> as it leads to the severe destruction of surrounding structures vital for the healing to occur.

## Conclusion

It is of prime importance to educate the parents, teachers, and the general public about the significance of early management of avulsed tooth and the importance of appropriate storage media. Besides, strict adherence to the recent guidelines for the management of traumatic injuries to the teeth will not only contribute to the prognosis and survival rate of replanted teeth but also restores the functions and esthetics which can have a large impact on the patient's quality of life.

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