

REPLANTATION OF AVULSED PERMANENT CENTRAL
INCISOR: A CASE REPORT

ABSTRACT

The aim of this report is to present the case of an accidentally avulsed left maxillary central incisor kept in cold milk from the moment of trauma until its replantation 3 h later in a 13-year-old boy. The avulsed tooth was replanted back into the alveolar socket and splinted with composite resin. Calcium hydroxide intracanal dressing was used to prevent inflammatory root resorption. Radiographic and clinical examinations were performed during 3 months follow-up. During the 3 months follow-up period, the tooth remained in a stable functional position and did not reveal replacement resorption. The amount of damage to tooth and supporting structures, emergency treatment and follow-up period play a role in the prognosis of the avulsed tooth. It can be recommended to keep the avulsed tooth in cold milk at least when more appropriate storage media are not on hand immediately.

Keywords: Avulsion, follow up, replantation, root resorption

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INTRODUCTION

Tooth avulsion is complete displacement of a tooth from its socket. It is seen in 0.5–3% of all dental injuries. The prevalence of avulsion cases in children increases between the ages of 7 and 9 years due to incomplete root development and minimal resistance of the alveolar bone/periodontal ligament (PDL) against extrusive forces during the eruption period of the teeth.¹

The etiology of tooth avulsion varies according to the type of dentition. Avulsion in primary dentition is typically a result of hard objects hitting the teeth, whereas avulsion in permanent dentition is generally a result of falls, fights, sport injuries, automobile accidents, and child abuse.^{2,3}

The primary goal in treating an avulsed tooth is to preserve and treat the supporting tooth tissues and to replant the avulsed teeth. The success of replantation depends on the patient's general health, the maturity of the root, the time the tooth is out of its socket, and storage medium.^{4,5} The

period of extra-oral time and the storage medium have the most critical effect on the status of the PDL cells.⁶

The healthy cell survival rate of pulp and periodontal ligament fibers begin to decrease by lack of blood supply, dryness and possible bacterial contamination when the tooth is removed from its socket.⁷ Innermost cell layers of the root surface should be vital for the proper regeneration of the periodontal ligament. Although pH, osmolality, and temperature of the storage medium is important for the survival of periodontal ligament cells, wet storage is the main environment to save the avulsed tooth.⁸

The aim of this report is to present the case of an accidentally avulsed maxillary central incisor kept in milk solution from the moment of trauma until its replantation 3 h later in a 13-year-old boy.

CASE REPORT

A 13-year-old male patient with an avulsed right left incisor



Fig1: Avulsion of the left maxillary incisor.



Fig 2: Laceration of lower lip



Fig 3: Pre- operative radiograph showing socket wrt. 21



Fig 4: Cleaning of the socket



Fig 5: Replantation of avulsed left maxillary incisor into the socket



Fig 6: Splinting of the avulsed tooth with orthodontic wire and composite resin



Fig 7: Suturing of lower lip



Fig 8: Radiograph after splinting



Fig 9: Removal of sutures after one week



Fig 10: Removal of splinting after 6 weeks



Fig 11: Radiograph 3 months after replantation

(fig 1) and lacerated lower lip (fig 2) reported to the Department of Pedodontics and Preventive Dentistry in Sri Guru Ram Das Institute of Dental Sciences and Research, Amritsar after banging into a door. Avulsed maxillary central incisor had been kept in milk from the moment of trauma until its replantation 3 h later. The crown of the avulsed tooth was intact and the root had a closed apex. No other oral injury was detected clinically.

The patient was immediately anaesthetized and the alveolar socket was washed with saline solution and betadiene to remove the blood clot (fig 4). The avulsed maxillary left central incisor was dipped in Minocycline solution and was replanted back into the alveolar socket with the help of finger pressure (fig 5). The tooth then splinted to the adjacent teeth with composite resin (fig 6) and the lower lip lacerations were also repaired with sutures (fig 7). The patient was instructed about biting habits and oral hygiene implement. A 7-day course of systemic penicillin and metronidazole was prescribed, and the patient was referred to the medical practitioner for an antitetanus booster.

The sutures were removed one week later the replantation later (fig 9) and the root canal of the replanted tooth was mechanically prepared. Calcium hydroxide paste was used as an intracanal dressing during the endodontic treatment (1 month) to prevent inflammatory root resorption. The splinting was removed 6 weeks (fig 10). The teeth were restored with composite resin after root canal treatment.

Radiographic and clinical examination was performed after 3 months follow-up period (fig 11). The tooth remained in a stable functional position and did not reveal clinical ankylosis or replacement resorption.

DISCUSSION

The best healing potential of the avulsed tooth is possible if the replantation is performed immediately (within 5 min) after trauma, as avulsion create crucial damage on the gingiva, periodontal ligament and pulp tissues.^{9,10} The

outcome and success rate of the replantation depend on many factors such as status of avulsed tooth, root development stage, dryness in extra-alveolar period, storage environment, the treatment time and modality. Storing the tooth in a physiological medium (e.g. HBSS, saline, milk, or saliva) until replantation for a short period is accepted as a well application.¹¹

The mature teeth in children and adolescents exhibit more extensive inflammatory root resorption after replantation compared to adults. The mentioned increase in resorption rate is related to the bone remodeling which is more extensive in children during the grow-up period. The root resorption and ankylosis may give rise to infra-occlusion during the growing process.¹²

It is necessary to splint the replanted tooth to the adjacent teeth for periodontal healing and then to perform root canal treatment to prevent the inflammatory root resorption in cases with closed apex. In the presented case, the avulsed incisor had a closed apex and was kept in milk from the moment of trauma until its replantation 3 h later. It was aimed to prevent the tooth loss, maintain aesthetic and functional properties and minimize inflammatory root resorption when performing the treatment. In order to achieve the goal of the treatment, the avulsed tooth was replanted back into its original socket, and then splinted to the adjacent teeth with composite resin for 6 weeks. During this period, the patient was recommended to avoid biting on the splinted teeth and continue to brush her other teeth, and keep the mouth and teeth as healthy as possible.

According to traumatology guidelines and articles on delayed replantation cases, PDL cells will be necrotic following delayed replantation, resulting in a poor long-term prognosis. Most avulsion trauma occurs before the patient's facial growth is completed.^{2,13} Preventing resorption of the surrounding bone and maintaining the tooth in the space of the arch are critical until facial growth is completed. Replantation can restore the patient's esthetic appearance

and occlusal function and prevent physiological trauma, which may be associated with a missing anterior tooth. If the avulsed incisors had not been replanted in the present case, other treatment options might have included prosthetic replacement of the missing incisor, space closure with orthodontic treatment, or autotransplantation of another tooth to the empty space.

Replanted teeth must be monitored carefully and clinical/radiographical findings should be recorded. In children and adolescents, ankylosis is frequently associated with infraosition of the replanted tooth.

In this case, the replanted tooth remained in a stable functional position and did not reveal clinical ankylosis or replacement resorption during the 3 months follow-up period. The complications such as root resorption and ankylosis occur by a majority in the first year after replantation. The mentioned complications can also be seen in later periods. Therefore, long follow-up period is essential for the replantation cases.

CONCLUSION

Despite an extended extra-alveolar dry storage time, teeth with delayed replantation might be retained in a stable and functional position in the dental arch. In patients for whom growth has not ceased, using the replanted tooth to maintain the surrounding bone for a few years until the patient is a viable implant candidate can be considered a suitable therapeutic option.

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