Dental Trauma and Replantation of Avulsed Teeth

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Abstract: Avulsion of tooth or teeth is defined as displacement of tooth from its socket. An avulsed permanent tooth is one of the few real emergency situations in dentistry. Avulsion of teeth occurs most often in children between 7 and 9 years of age. It requires quick emergency intervention for favourable healing followed by evaluation and possible treatment at decisive times during the healing phase. Replantation is the first line of treatment for avulsed teeth when extraoral time is less and minimal damage to the PDL. It includes stabilization of teeth in its normal position which helps in reattachment and reorganization of the periodontal ligament**.** Every possible effort should be made to replant it in order to avoid esthetic, masticatory, phonetic difficulties and avoid arch length discrepancy. [Patil S et al NJIRM 2013; 4(3) : 166-169]

Key Words: Avulsed teeth, traumatic injuries, replantation

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Introduction: Tooth avulsion (exarticulation, total luxation) is defined as total displacement of the tooth out of its socket. Incidence of avulsion is reported to be less than 3% of all dental injuries[1.] These injuries require quick emergency intervention for favourable healing.[2] Traumatic injury to the maxillary anterior teeth is not uncommon in young children. Avulsion injury causes damage to dental and supportive tissues. The permanent maxillary incisors are the most frequently avulsed and luxated teeth and require quick management. The most important factor in the management of avulsed teeth is time and the percentage of success of tooth replantation has been observed to be low, ranging from.[4, 5] Severe trauma or non physiologic extraoral storage of an avulsed tooth may lead to irreversible damage to the periodontal ligament cells, particularly of the cementoblasts. The immediate concern is to stabilize the tooth in its normal position to allow re-attachment and reorganization of the periodontal ligament support**.**[6] Early management of avulsed tooth is replantation of the tooth back into the socket within 20-30 min after injury**.**[7] Healing with periodontal ligament regeneration after the replantation will occur only if inner most cell layers along the root surface are vital.[8] So, following the traumatic loss of an anterior tooth or teeth, it is important that an immediate replacement is done. This paper presents a case of replantation of avulsed teeth of an adult patient which remained functional and clinically and radiographically acceptable during the observation period of one year.

Case report: A 43 year old male patient reported with a chief complaint of dislodged teeth due to domestic violence about one hour back. Extraoral examination revealed soft tissue injury of upper and lower lip, but there was no asymmetry of the head and neck region. On intraoral examination, it was found that maxillary left central and lateral incisors had been avulsed (Figure.1). Patient had poor oral hygiene. Blood clot was found in the alveolar socket. Examination of the avulsed teeth revealed that the tooth crowns were intact (Figure.2). Periapical radiograph revealed empty sockets with no other hard-tissue injury (Figure.3). The patient's medical health history was noncontributory.

Although the teeth were stored in a jar of water for an hour, replantation of the teeth was planned to retain in the sockets for as long period as possible. As this case was of delayed replantation, endodontic treatment was completed before replantation. Cleaning of the tooth surfaces was carried out with saline and surface treatment was done with tetracycline to delay the resorption. Coronal access cavities were sealed with glass ionomer cement. Then, about 2mm of apices were resected for the ease of placement into the socket followed by retrograde filling with MTA (Mineral Trioxide Aggregate). Under local anaesthesia, the sockets were gently curetted to remove any

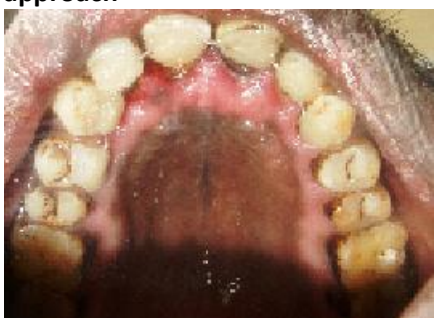
coagulum, granulation tissue and pathologic tissue and irrigated with physiologic saline solution.

Figure.1 Intraoral view showing missing left central and lateral incisors

Figure.2 Avulsed left central and lateral incisors

Figure.3 Radiograph showing empty sockets

Figure.4 Splinting of avulsed teeth performed via palatal approach



Teeth were then replanted into their respective sockets and confirmed by radiograph. Once the teeth were properly seated, they were checked for alignment and occlusion and functional splinting was done (Figure.4). Radiograph was again obtained to confirm proper positioning of the reimplanted teeth (Figure.5). Oral hygiene instructions were given and 0.2% chlorhexidine mouthwash was recommended. Splint was left in place for 2 weeks. Patient was recalled at 3, 6 and 12 months and checked clinically and radiographically (Figure.6, Figure.7 & Figure.8). Adjacent teeth were asymptomatic and responded to pulp sensitivity test. During this period treated teeth were stable esthetically as well as functionally.

Figure.5 Radiograph showing teeth are in proper position immediately after splinting

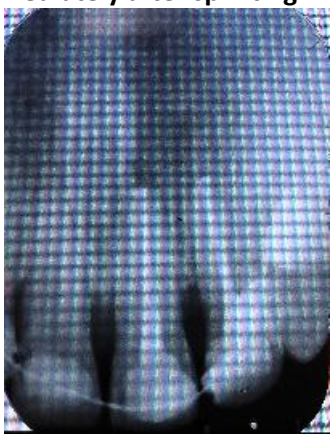


Figure.6 Palatal view showing teeth are in position and stable after 6 months

Discussion: Trauma to the dentition is considered an emergency situation as it results in functional and esthetic disturbances accompanied by concern from the patient. Avulsion of teeth is a serious assault on the gingiva and periodontal ligament.

Andreason et.al had observed that the progression of root resorption in teeth with extended extra-oral periods is related to age. In age group of 8-16 year old the rate of root resorption is significantly higher compared with 17-39 year old patients.

Figure.7 Radiograph showing replanted teeth in position after 6 months

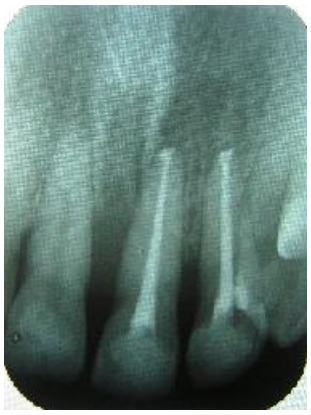


Figure.8 Labial view showing esthetically and functionally positioned replanted teeth after 12 months

In cases of avulsed teeth with non vital PDL, treatment with various agents such as tetracycline, stannous fluoride and emdogain before replantation have been suggested to slow down the resorption process.[6] Most conservative approach for managing the avulsed incisors is to reimplant them as soon as possible. Studies have shown that teeth replanted within 20-30 minutes after avulsion have the best prognosis.[7] Teeth replanted after 60 minutes of dry storage become ankylosed and are resorbed within 7 years in young patients, where as similar conditions in older than 16 may remain functional for considerably longer periods.[8]

Complications after replantation of avulsed teeth are common with a reported prevalence of 57-80%.[1] Replantation can restore the patient's esthetic appearance and occlusal function shortly after the injury and the replanted incisor can be functional for some years. Dental ankylosis frequently occurs when a tooth is traumatically luxated or replanted after being avulsed. In a young growing child, dental ankylosis can "anchor" the tooth to the alveolar bone and disturb normal growth of the alveolar process. Depending on the patient's age, retention of the permanent incisor can maintain the aesthetic appearance, occlusal function and alveolar ridge height. Though the risk of progressive replacement resorption and subsequent tooth loss is high after a long dry storage, reimplantation makes a provision for an aesthetically acceptable permanent prosthesis at a later age. We conclude that, in case of avulsed permanent teeth with prolonged non-physiological storage, replantation should be performed irrespective of the outcome despite the risk of progressive replacement resorption and subsequent tooth loss.

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