Case Report

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Delayed Replantation of Avulsed Permanent Maxillary Central Incisor with 2 Years of Follow Up: A Case Report

Abstract:
Traumatic dental injuries are highly prevalent now a days. Present article discusses a case report of 13 years old male patient who reported with a dental emergency of left maxillary tooth avulsion. Patient kept the avulsed tooth in non physiologic media. Patient was treated as per the guidelines of international Association of Dental Traumatology. Replantation of avulsioned tooth is a preferred mode of treatment followed by physiologic splinting for a short period of time. Root canal therapy is required for the affected tooth in cases of delayed replantation. Patient's clinical and radiographic follow up was done up to 2 years which showed patient remained asymptomic.

Keywords: Avulsion, Storage Media, Root Surface Treatment, Replantation.

Introduction:

Tooth avulsion is a clinical condition which manifests as complete dislocation of a tooth out of its socket.[1] It is a frequently reported emergency in the dental clinic. Avulsion of permanent teeth is seen in 0.5%–16% of all dental injuries. [2-3] The prevalence of avulsion cases in children increases between the ages of 8-12 years due to incomplete root development and minimal resistance of the alveolar bone and periodontal ligament (PDL) against extrusive forces during the eruption period of the teeth.[4-5]

The ideal treatment for an avulsed permanent tooth is its immediate replantation back into its socket.[6] Tooth replantation maintains the bone dimensions and re-establishes the appearance and function. Thus replant is always a preferred mode of treatment as if it fails other treatment modalities can be performed at later age.[1]

Tooth replantation is a technique sensitive procedure and the victory is always dependent on the multiple factors such as patient age and health, stage of root development, extra oral dry time and storage media.[7-8] The aim of this article is to present a case report on management of avulsed permanent maxillary central incisor along with its clinical and radiographic follow up to 2 year.

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Case report:

A 13 years old male patient reported to the Department of Paediatric & Preventive dentistry with a chief complaint of complete knock out of a tooth in upper front region of mouth while playing in school basketball ground 2 hours ago. Patient gave history of fall on the floor due hit by one of his batch mates. Patient brought the tooth in a water filled box. Before examining the patient, tooth was cleaned gently with a stream of saline (0.9%w/v) and kept into 1% doxycycline for 5 minutes and then transferred to acidulated phosphate fluoride gel (Pascal 60 sec APF gel) for next 20 minutes for root surface treatment. Clinical examination revealed mobility and

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displacement with respect to right maxillary central incisor and empty blood coagulum filled socket with respect to left maxillary central incisor. No associated head or other severe injuries were reported and patient remained conscious after the injury. Intraoral peri-apical radiograph was taken with respect to maxillary central incisor teeth which revealed peri-apical radiolucency with respect to right maxillary central incisor and absence of tooth with respect to left maxillary central incisor. (Figure.1)

Final diagnosis was made sub-luxation with respect to right maxillary central incisor and avulsion with respect to left maxillary central incisor. Repositioning of right maxillary central incisor was planned whereas for left maxillary central incisor replantation and root canal therapy were planned followed by physiologic splinting.

Figure1. Preoperative Radiographic and clinical picture

Firstly topical anaesthetic jelly (ProGel-B by Septodent) was applied above the muco-gingival junction with respect to maxillary central incisor teeth followed by local infiltration of anaesthetic solution deposition (Lox-2%) that contains no vasoconstrictor just to avoid any delay in the healing process. Socket irrigation was done with saline. Repositioning and replantation was done with respect to right and left maxillary central incisor teeth respectively using mild digital pressure. Care was taken to hold the avulsed tooth with crown portion only. Radiograph was taken to check the correct placement of both the tooth. Flexible splinting was done from right maxillary canine to left maxillary canine teeth using 28 gauge stainless steel wire and composite (Filtek bulkfill by 3M). (Figure 2)

Figure 2. Post splinting Radiograph

Patient was instructed to clean the oral cavity with 0.12% chlorhexidine mouthwash (Hexidine) 4-5 times a day, to take only soft diet followed by soft tooth brushing for next few weeks. Patient was also referred to paediatrician to take anti-tetanus injection. Systemic antibiotics (amoxicillin 375 mg) were prescribed for next 7 days. After one week patient was recalled, access opening was done with respect to left maxillary central incisor under local anaesthesia. Pulp extirpated successfully and working length was taken followed by biomechanical preparation along with chemical debridement using hypochlorite (5%) and saline irrigation. (Figure 3)

Calcium hydroxide dressing (Multi-Cal by Pulpodent) was given for next 14 days with respect to left maxillary central incisor. After 21 days Splint was removed and calcium hydroxide dressing was changed. Then patient was recalled after next 2 weeks and root canal obturation was done with gutta percha and ZOE sealer (Zical).(Figure 4)

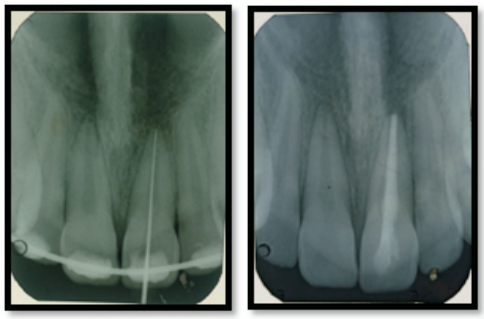

Figure. 3, 4. Working length and Post obturation Radiograph

Figure 5. Post operative clinical picture

Patient was recalled at 3 month, 6 month, 1 year and 2 years for clinical and radiographic follow up. (Figure 6,7,8,9)

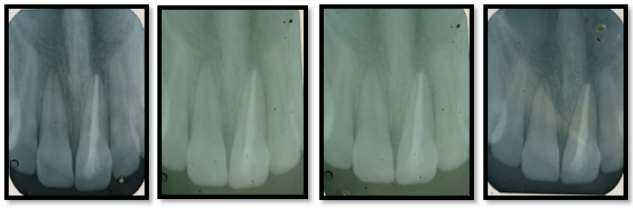

Figure. 6,7,8,9. Radiographic follow up at 3 months, 6 month, 1 year and 2 years

Discussion:

To achieve desirable results, tooth replantation requires the correct following of guidelines provided in the literature for avulsed tooth management. Tooth replantation should be treated as an emergency to decrease the damage to pulp and periodontal tissues.[9] Extra-oral dry time and the storage media play an imperative role in estimating the prognosis. For successful outcomes it is necessary to store tooth in a physiologic media such as milk, HBSS, ViaSpan, Propolis and Gatorade. In the present case, patient kept tooth in normal tap water which is a hypotonic media with non-physiologic pH, osmolarity and shows higher chance of microbial contamination.[10-11] Thus before replantation tooth was soaked into 1% doxycycline for root surface treatment as per the International Association of Dental Traumatology (IADT) guidelines followed by 2.4% acidulated fluoride solution for 20 min which is suggested by Andreasen and Andreasen.[12-13] Doxycycline is an effective antimicrobial and anti-inflammatory drug. The periodontal ligament cells receive contamination on ex-articulation from extraoral environment or from storage media. Amoxicilline is the most preferred systemic antibiotic to prevent post operative complications in the management of avulsed tooth.[12] various authors suggest the use of some fluoride solutions may show higher resorption resistant root surface in a replanted tooth as demineralized dentine prove better adhesion of fluoride on to the tooth surface via conversion of hydroxyapatite into fluorapatite.[14] Gulinelli et al[15] observed lower root resorption with the use of 2% acidulated phosphate sodium fluoride and 15% propolis in delayed replantation cases.

Stabilization of replanted tooth is required to permit the faster healing. Several modes of stabilization have been suggested; out of which physiological splinting for a short period of time is the most preferred one due to ease of hygiene maintenance and minimal discomfort to the patient.[16-17] But it is necessary to place composite material in the middle third of the labial surface of crown as its displacement to inter-proximal or gingival area may cause secondary infection.[12]

IADT suggested flexible splinting only for 2 weeks however this time period can be extended up to 4 weeks in cases of delayed replantation.[18] Alvarez and Alvarez[19] recommended splinting period of 2-3 weeks to acquire better periodontal healing and to retain physiologic mobility. Vasconcelos et al[20] suggested that longer duration of fixation may cause ankylosis. Similarly in the present case we kept splinting period of 3 weeks as the extra-oral dry time was around 2 hours.

After a dry time of more than an hour, pulp tissue and periodontal ligament cells are usually non vital. Thus root canal therapy should be performed for best outcomes; it should be initiated within 7-10 days of replantation. Similarly in the present case access opening was done at 7th day followed by Calcium hydroxide dressing for one month to maintain the alkalinity in the peri-apical area and to avoid any post operative complications.[18]

Most common post operative complications seen in replanted tooth are inflammation related resorption or replacement resorption or ankylosis. Inflammatory resorption is due to stimulation to odontoclast cells which leads to dentine resorption within the tooth. Ankylosis is mainly resulted when osteoblast cells start deposition of bone matrix.[21] The occurence of inflammatory root resorption can be prevented by endodontic treatment while in cases replacement resorption advanced options like decoronation technique should be taken into considereation.[22] Such complications usually seen within 6 months. If there are no such complication reported till 2 years, chances of failure are very rare.[21] In the present case follow up done up to 2 years, no such post operative complication were noticed.

Conclusion:

Tooth replantation is a simple, cost effective, easily acceptable and less threatening procedure to the young patient. It should be considered as principal management technique for avulsed tooth as it maintains the bone quality, aesthetics and function. In the present case despite of delayed replantation tooth remain free from any post operative complications till two years and maintained its anatomic position in occulsion. Thus we suggest that to avoid any post operative complications of replantation correct guidelines should be followed.

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