Original Research Paper

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Delayed Replantation of Avulsed Tooth After 3 Days Extra-Oral Time and 1-Year Follow-Up

Dental Science

KEYWORDS : Tooth avulsion, tooth reimplantation, fluoride, splinting.

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ABSTRACT

One of the most common injuries of anterior tooth in children and young adults is Avulsion. Recommended treatment of the avulsed tooth is immediate transplantation which has varying degree of successful prognosis.

The present case focuses the1-year follow-up of delayed replantation (after 3 days)of upper right central incisor that was avulsed due to trauma No complications were seen in the present case even after one year follow up, clinically the tooth showed signs of resorption or ankyloses.

Conclusion: Delayed replantation of avulsed tooth may be a good alternative to prosthesis regardless of its long term complications like Ankyloses or root resorption, Dentists should try to create awareness in the society & educate regarding management of avulsed tooth at the accident site and the measures to be taken.

Introduction:

complete displacement of tooth from its socket is known as avulsion.Avulsion of permanent teeth is seen in 0.5-3% of all dental injuries(1,3)It is the most common injuries of tooth widely seen in children as roots are not completely formed and periodontium and bone are resilient (2)..Etiological factors may be hitting the teeth with hard objects as a result of fights,falls,sport injuries, automobile accidents & child abuse(4,5,6) Avulsion most commonly occurs in maxilla and maxillary central incisors are commonly affected .Etiological factors like increased overjet and incompetent lips are contributing in avulsion cases(7) . Ideal treatment plan for an avulsed tooth is immediate replantation which helps in reestablishment of esthetics and function (8)

Case report

A 19-year-old boy was referred to the department of conservative and endodontics with history of fight that resulted in dental trauma. The trauma occurred 72 hours ago.The boy was taken to a general physician and there were no signs of any medical complications. The avulsed tooth was brought wrapped in a piece of cloth. The intraoral examination revealed that the maxillary right permanent central incisor [tooth 11] was avulsed (Figure 1).Ellis class III fracture was seen with (tooth 12) and Ellis class II with (tooth 21)

Fig [1] Avulsion of the right upper incisor Fig [2] IOPA of avulsed tooth Fig [3] Palatal view of avulsed tooth

IOPA was taken to rule out any alveolar bone wall fracture or other hard tissue injuries in that region. On Examination of the avulsed tooth it showed no fracture, the root had a closed apex, and dry periodontal tissue remnants covered the root surface. After administration of local anesthesia to the patient, socket of the tooth was gently rinsed with saline solution and chlorhexidine to clean of any debris or blood clot.

The root of the tooth was cleaned carefully with saline to remove any remnants of necrotic and dried periodontal tissue, and then kept in 2% sodium fluoride solution followed by placement in doxycycline antibiotic solution. Root canal treatment was carried out extra orally on the avulsed tooth, Obturation was done with guttapercha and the tooth was replanted slowly in the socket, with slight digital pressure. Radiograph was taken to check the position of the replanted tooth. Stabilization was done using a flexible splint from canine to canine and the acid-etch composite resin technique (Figures 10).

Figure 4, 5, 6&7 extra oral root canal treatment carried on avulsed teeth

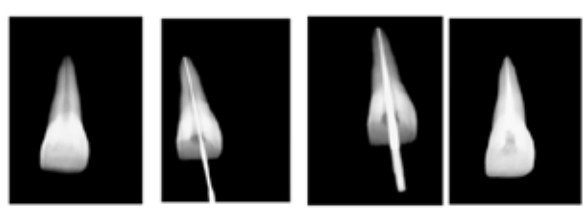

Figure [8] Doxycycline & sodium fluoride

Figure [9] Etching of avulsed tooth

Figure [10] Splinting of the avulsed tooth with braided orthodontic wire and composite resin

Soft diet and chlorhexidine mouth rinse was advised during the stabilization period and the patient was followed up every week upto four weeks and no signs of clinical or radiological pathological changes were seen. After four weeks the splint was removed, composite build up was done on 21.Fiber post was placed on 12 followed by composite build up and crown placement. Patient was regularly kept under follow up every 3 months.12 months follow up showed no signs of mobility ,resorption or ankyloses.

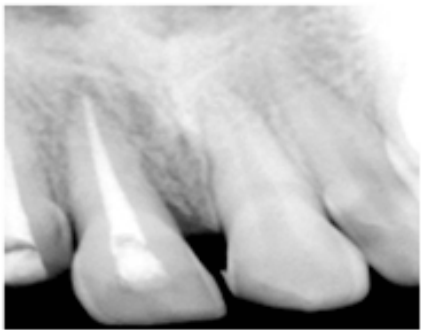

Fig [11] one month follow up

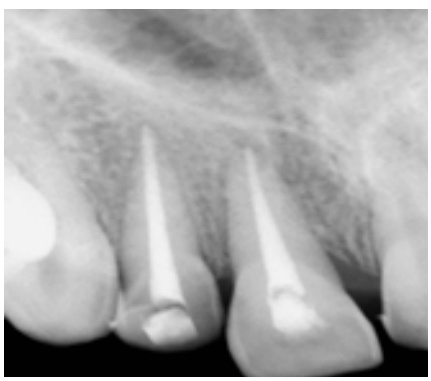

Fig [12] Three month follow up

Fig [13] Six month follow up:

Fig [14] one year follow up

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Discussion:
Immediate replantation is the first choice of treatment for an avulsed tooth under clinical conditions various factors such as intensity of trauma, vitality of PDL,extraalveolar period,time,solution used for tooth storage, time elapsed between the avulsion and reimplantation,maintainence of pulp vitality, preparation of tooth and alveolus affects the outcome. [9, 10, 14,]After avulsion, replantation within 5 min have best prognosis as stated in literature [11].

In the present case the tooth was brought by patient in a dry piece of cloth and the extra-oral dry time was more than 60 minutes i.e. 72 hours, As the PDL cells are nonviable after dry time of 60 mins or more the root canal treatment was carried out extra-orally as described by the International Association of Dental Traumatology [3]. Storage transport media during the extra-oral time also play an important role in replantation. The tooth should be stored in a suitable media, such as HBSS, saline, milk, or saliva until it is replanted [12].

Prior to replantation the tooth was soaked in acidulated sodium fluoride solution followed by placement in doxycycline antibiotic. In literature it is stated that sodium fluoride reduces the rate of osseous replacement and the tooth might become more resistant to resorption. [13] Fluoride directly acts on the bone tissue, cementum and dentin by converting hydroxyapatite into fluorapatite. Frequencies of ankylosis and inflammatory root resorption decreases after topical application of doxycycline [15].

In this case semi rigid splinting was done with acid etch composite resin and arch wire from canine to canine, semi rigid splint is preferable over rigid splint because physiologic movement of teeth during healing results in decreased incidences of ankyloses.[16], it has been proven that rigid splint accelerates root resorption in both immature and mature teeth.[17]

According to guidelines of traumatology PDL cells will be necrotic following delayed replantation, resulting in a poor prognosis. [1, 3, 4, & 18] Most commonly avulsion occurs in pediatrics patients, space maintenance and prevention of resorption of surrounding bone is major critical factor at this age group as facial growth is incomplete during this period. However, replantation not only restores patient's esthetic appearance but also aids in occlusal function and prevent physiological as well as psychological trauma, often associated with missing anterior tooth. Other treatment options that can be consider for the present case include prosthetic replacement of the missing incisor, orthodontic space closure ,or auto transplantation of another tooth to the empty space.

In the present case even after one year follow up no clinical signs of infection, resorption, or, ankyloses were reported.

Conclusion: Dentists should try to educate and create awareness in the society regarding management of avulsed tooth at the accident site and the measures to be taken. Satisfactory space maintenance in the arch and aesthetic might be maintained even with the delayed implantation in a stable and functional position in the dental arch.

Conflict of Interests
The authors declare that there is no conflict of interests regarding the publication of this paper.

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