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Delayed Reimplantation of Avulsed Maxillary Central Incisors: A Case Report

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Abstract

A 13-year-old boy reported to the dental operatory with a history of trauma. He had a fall from motorcycle and on examination it was noted that due to the impact his 11 and 21 had avulsed out in total. He came to Dental college with both the teeth wrapped in tissue paper. Although the tooth was in highly unfavorable storage condition, with extraoral time being more than 3hrs, it was still decided to re-implant the teeth since the patient was young and to relieve him from psychological, cosmetic and functional trauma. Even though the long-term prognosisis uncertain, this treatment technique has proven to be an advantage for the patient in this growing period by maintaining the esthetics, by maintaining the height of alveolar bone and making the provision of an aesthetically acceptable permanent restoration at a later age if in case prognosis becomes poor.

Keywords: *Reimplantation, Maxillary Central Incisors, Avulsion, Periodontium, Traumatic Injuries*

INTRODUCTION

Tooth avulsion, is one of the most common case of all traumatic injuries, with 0.5-16% range in permanent dentition.[1] Avulsion is most commonly seen in young ages. This is mainly due to the fact that the periodontium and bone are very resilient and roots are not completely formed[2]. Avulsion not only leads to loss of function, but also will result in a negative impact on quality of life, producing psychological and social discomfort leading to lowered self-esteem, embarrassment upon smiling and difficulty in relating with others.[3] Ideal treatment for avulsed teeth is immediate reimplantation to maintain function and esthetics. But there are so many factors that influence the outcome of treatment such as duration of extraoral time, storage media, presence of fracture if any etc. For best prognosis, reimplantation should be done within 5 min and according to Andersen, reimplantation of tooth beyond 5 min is delayedreimplantation.[4] Reimplantation within 20-30 min after the injury or keeping the tooth in an appropriate storage media as also shown to produce good prognosis.[4]As the duration of extra oral time increases, the likelihood of root surface damage also increases which invariably leads to necrosis of the pulp tissue, cemental and periodontal ligament tissue leading to external root resorption and eventually loss of re-implanted teeth. Inflammatory resorption and replacement resorption are usually observed after 1 and 1-2 months, respectively.[5] The purpose of this paper is to report the clinical and radiographic condition of upper two central incisors which wasre-implanted after 3hrs and stored in unfavorable conditions.

Case Report

A 13-yr. old patient had reported to dental operatory after fall from motorcycle and due to this impact, his upper central incisors (11 and 21) had avulsed out. Patient reported to Dental College after 3 hrs of injury with both the teeth wrapped in dry tissue paper. On extraoral examination there was abrasion, laceration and swollen upper lip. On intraoral examination both 11 and 21 had avulsed out and socket

was empty. On palpation dentoalveolar fracture was ruled out. RVG was taken which revealed no other fracture of adjacent structures. (Figure 1 a & b). Patient was explained about the possible complications (inflammatory resorption, replacement resorption/ankylosis, tooth discoloration) involved with replanting an avulsed tooth. After obtaining informed consent, it was decided to reposition and replant the avulsed tooth. The avulsed tooth had an intact crown and a well-formed root with a closed apex. The root surface was gently rinsed with normal saline in order to remove any debris that had adhered to it. Since the tooth was stored in unfavorable storage condition and extra oral time being more than 2 hrs., root canal treatment was done extra-orally (Figure 2 a & b). After administration of local anesthesia, socket was gently irrigated with normal saline to remove any debris present. Tab Doxycycline (100mg) was crushed, mixed with saline and placed into the socket for local antibiotics coverage (Figure 3). Topical treatment with doxycycline reduces microorganisms not only in the pulpal lumen but also on the root surface. It has antibacterial and anti-inflammatory properties. Therefore, this type of treatment could decrease the frequency of ankylosis.[6]. The roots were immersed in 2% APF gel for 5min and then the teeth were gently re-implanted in to the socket by using finger pressure. After checking the occlusion and alignment composite splinting was done from canine to canine. X-ray was taken to confirm the tooth in the socket. (Figure 4a & b). In x-ray un-erupted mesiodens was noted. Since the patient was not interested to get it removed it was left in place (Figure 5.). Extra oral wounds were cleaned with povidone iodine and sutures placed for deep cuts on the skin. Analgesics and antibiotics tablets were given for 5 days. Single dose Tetanusvaccine (0.5ml) was given IM as precautionary measure. Since the tooth was not completely firm after 10 days it was decided to continue with the splint for another 20 days. The splint was removed after 4 weeks. The tooth was asymptomatic and no mobility was noted. The patient had come for follow up every month. After 5th months slight radiolucency was observed in x-ray with respect to root apex of 11. But the patient was comfortable and the tooth was asymptomatic.

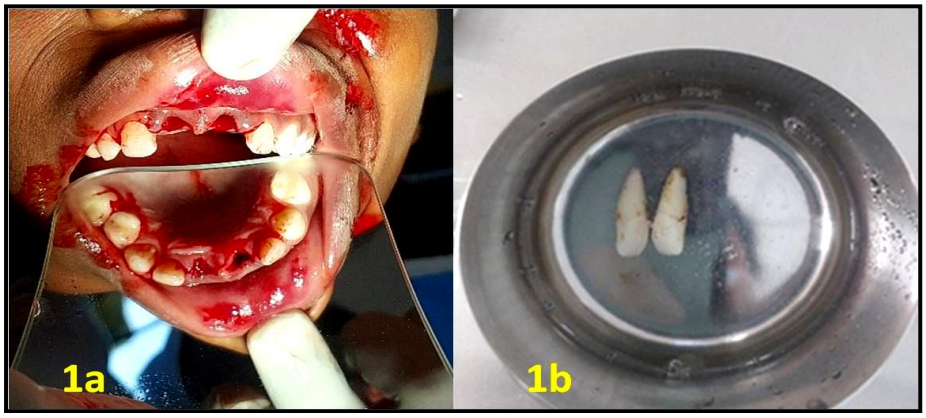

Figure 1 (a&b): Preoperative photograph showing avulsion with 11,21

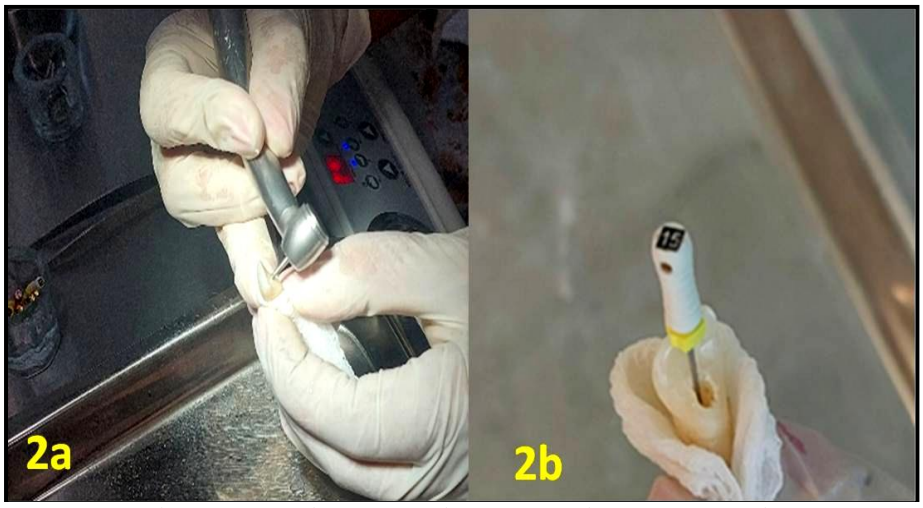

Figure 2 (a&b): Extra Oral Root canal treatment done wrt 11 and 21

Figure 3: Local antibiotic coverage with tab doxycycline placed into the socket.

Figure 4(a&b): Photograph showing 11 placed in the socket with gentle finger pressure and composite splinting from canine to canine done

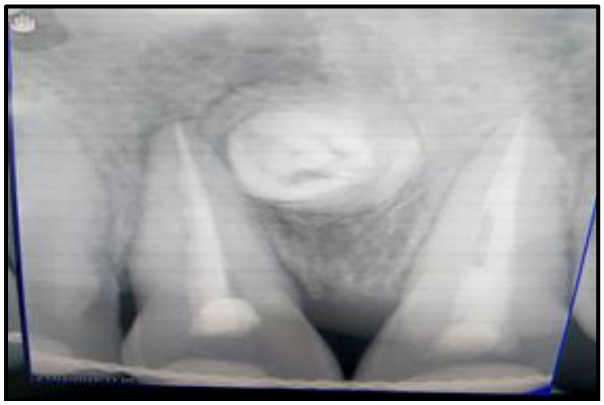

Figure 5: Composite Splinting done from canine to canine and x-ray showing presence of mesiodens

DISCUSSION

Immediate reimplantation of the avulsed tooth is the most appropriate treatment. But this may not always be possible. In the present case, the patient had come to dental college after almost 2-3hrs after the fall. The avulsed incisors were wrapped in dry tissue paper. Teeth were air dried for prolonged time. During such circumstances, even if the treatment is delayed, we have to consider the benefits from the treatment. Hence re-implantation need to be attempted.[7] Even though chances of periodontal healing are low and risk of inflammatory resorption and ankylosis is high the main treatment objective should be retaining the avulsed tooth to maintain esthetic appearance, occlusal function and alveolar bone height. When a tooth remains out of the oral cavity for more than 1hr all the surface periodontal cells die.[8] And due to excessive drying these periodontal ligament cells elicit inflammatory response over the root surface area affecting the prognosis of the tooth. In our present case extraoral time was prolonged and tooth was not brought in suitable storage medium. Hence extra-oral endodontic treatment was done. Furthermore,

when endodontic treatment is carried out on avulsed tooth before reimplantation, it improves the chance of retention and prevention of replacement resorption.[9] Tooth was immersed in saline and RCT was done taking care so that root surface was not disturbed. Before reimplantation the root surface of 11 and 21 was soaked in 2% APF gel assuming that demineralized dentin surface would be more prone to fluoride incorporation and might become more resistant to resorption. Alveolar sockets were gently irrigated with saline to remove any debris. The teeth were placed into the socket with gentle finger pressure. After checking teeth alignment and occlusion composite splinting was done from canine to canine. In this case, splinting was done with composite and arch wire. The advantage of this technique is that it is much less stressful to the injured area because forces needed to apply are much less stressful than other techniques. X-ray was taken to confirm teeth in position. Antibiotics and analgesics were administered for 5 days. Follow up was done after 1week. Extra oral wounds were healed. Since the teeth were slightly mobile splint was continued for another 10 days. Splint was removed after weeks. Tooth was asymptomatic only slight physiologic mobility was noted. Follow up was done for 1, 2 and 3months. Further follow up and evaluation is required. Prognosis of delayed reimplantation is questionable as it may lead to ankylosis or replacement resorption. But, some cases of delayed reimplantation have shown successful outcomes. Harris A et al and Chalakkal P et al presented similar cases in which delayed replantation of avulsed tooth (with extra-oral dry time of 48 hrs and 10 hrs respectively) have shown successful outcome after 2yrs and 5yrs follow-up, thereby referring that replantation still remains a better option in any case of avulsion, be it immediate or delayed.[10]In our present study since the follow up period is short, further observation and follow up with necessary clinical and radiographic examination is necessary to evaluate the prognosis of the treatment.

CONCLUSION

Replantation is the treatment of choice following avulsion. It not only satisfies the patient's functional and aesthetic concerns but also helps to maintain the surrounding bone for prosthetic rehabilitation, in case of replantation failure. Despite an extended extra-oral time, replantation of an avulsed tooth can have a favorable outcome if all the recommended guidelines and protocols are followed.

REFERENCES

1. Andreasen JO, Andreasen FM. Classification, etiology and epidemiology of traumatic dental injuries. In: Textbook and Color Atlas of Traumatic Injuries of the Teeth, Copenhagen: Munksgaard; 1994. p. 151-77.
2. Sharma NK, Duggal MS. Replantation in general dental practice. Br Dent J 1994;176(4):147-51.
3. Cortes MI, Marcenes W, Sheiham A. Impact of traumatic injuries to the permanent teeth on the oral health-related quality of life in 12-14-year-old children. Community Dent Oral Epidemiol 2002;30(3):193-8.
4. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors Diagnosis of healing complications. Endod Dent Traumatol 1995;11(2):51-8.
5. Weine FS. Endodontic Therapy, 5th ed. St Louis, MO:Mosby–Year Book Inc.; 1996. p 218-31.
6. Ko MJ, Kim MS, Lee HS, Nam OH, Chae YK, Choi SC. Effects of Doxycycline-Loaded NO-Releasing Nanomatrix Gel on Delayed Replanted of Rat Molar. Gels. 2024 Mar 22;10(4):213.
7. Tsukiboshi M. Treatment Planning for Traumatized Teeth, Tokyo: Quintessence Publishing Co., Inc.;2000. p. 81-97.
8. Skoglund A, Tronstad L. Pulpal changes in replanted and autotransplanted immature teeth of dogs. J Endod 1981;7(7):309-16.
9. Ize-Iyamu IN, Saheeb B. Reimplantation of avulsed dry permanent teeth after three days: A report of two cases.Niger J Clin Pract 2013;16(1):119-22.
10. Chalakkal P, Thomas AM, Akkara F, Fernandes KS. Delayed replantation after endodontic and fluoride treatment: A 5-year follow- up. Int J Clin Pediatr Dent. 2011;4(3):228–31.