THE SAVING GRACE - INTENTIONAL REPLANTATION: A CASE REPORT

Pragya Wahengbam*, Brucelee Wahengbam**, Aseem Prakash Tikku#, Anil Chandra#

* Lecturer, Department of conservative dentistry and endodontics, Faculty of Dental Sciences, King George Medical University, Lucknow, UP, India. ** Reader, Department of conservative dentistry and endodontics, BBD College of Dental Sciences, Lucknow, UP, India. #Professor, Department of conservative dentistry and endodontics, Faculty of Dental Sciences, King George Medical University, Lucknow, UP, India.

Address for correspondence: Dr. Pragya Wahengbam, Lecturer, Department of conservative dentistry and endodontics, Faculty of Dental Sciences, King George Medical University, Lucknow, UP, India.

Email: w.pragya78@gmail.com

Abstract: Intentional replantation has been long considered to be the only recourse for saving a tooth when other options like traditional root canal therapy and surgery are inconceivable. The article discusses intentional replantation as a treatment option for a fallible case of broken instrument in the distal canal of left mandibular second molar. The critical factor required for the success of intentional reimplantation i.e. preserving the viability of periodontal ligament cells was given due attention by controlling the time factor, maintaining aseptic conditions and minimal manipulation of the root surface. Five year recall showed that the tooth was functional, asymptomatic and IOPA radiograph revealed a healing periapical area.

Keywords: broken instrument, instrument retrieval, intentional replantation, tooth reimplantation.

Introduction

Intentional replantation (IR) has been defined by Grossman as “the purposeful removal of the tooth and its almost immediate replacement with the object of obturating the canals apically while the tooth is out of its socket.” (1) IR is usually recommended in teeth with persistent chronic pain, refractory periapical pathology, vertical fractures, endodontic-periodontic lesions, certain anatomic malformations such as radicular groove and nonfeasibility of apicoectomy due to varied reasons. Limited accessibility, anatomic restrictions or refusal of the patients to undergo surgery. (2, 3, 4, 5) Contraindications include teeth with preexistent moderate to severe periodontal disease, multirooted teeth with diverging, long, curved roots that make extraction and reimplantation impossible. (6, 8) Though the process has been performed for years and was used extensively to manage odontalgia with a success rate of up to 95%, it is usually considered as the last resort treatment. (7, 9) The important aspects to be kept in mind to provide the best long term prognosis are that firstly the extraction of the tooth should be atraumatic and the tooth should be out of the mouth for the shortest period possible. (8) These factors if not taken care would increase the likelihood of replacement resorption which majorly decreases the survival rate of replanted teeth. (8, 9)

The paper illustrates a clinical case to exemplify the potential of intentional replantation as a viable treatment option in the select case.

Case Report

A 25 year old male presented with an acute pain...
and mild swelling in the mandibular left posterior region. The patient had a noncontributory medical history; radiograph taken showed that endodontic treatment had been attempted in the mandibular second molar which led to a separated instrument in the distal canal of 37. The separated instrument was screwed in the middle and apical third of the canal extending 5-6 mm beyond the apex of the distal root. There was radiographic evidence of chronic apical periodontitis (Figure 1a). Upon clinical examination tooth was tender to palpation and percussion. The periodontal probing depths did not exceed 3 mm. The first resort was retrieval of the separated instrument. All efforts for the retrieval of instrument fell futile due to the excessive wedging of the instrument through the apical foramina. Undue pressure in retrieving the instrument was avoided due to the danger of apical fracture. An invasive apical surgery was not a suitable option since instrument retrieval through a small bony window seemed difficult. Large periapical lesion as depicted by the radiograph also pointed towards the difficult removal of the granulomatous tissue via surgery as patient had limited mouth opening. Moreover other disadvantages like large volume bone removal required to access the apex of 37 and proximity of the surgical site to the mandibular canal pointed towards the inappropriateness of the case for a surgery. In view of all these limitations intentional replantation was indicated as the alternative choice. The patient was conveyed about the details of the procedure and a written informed consent was obtained. The next step was preparation of the canals with hand protapers. The mesial canals were prepared till the working length with an apical preparation of F2 and the distal canal was prepared up to the beginning of the separated / wedged instrument. Calcium hydroxide (metapex) dressing was given in all the canals and the patient was recalled after a week. At the patient’s return the canals were obturated till there prepared length using vertical compaction and warm guttapercha technique (Figure 1b). The core was build up with incremental layers of composite (Filtek Z 350 Universal restorative; 3M ESPE). Core build up with composite reinforced the tooth to prevent the possible fracture of the tooth during extraction.

Preparation for carrying out intentional replantation in 37 was done. The mouth was rinsed with 0.12% chlorhexidine gluconate and a mandibular block local anaesthesia was administered. Atraumatic extraction of the tooth was carried successfully and the extracted tooth was placed in cold normal saline solution. The socket was gently curetted to remove the apical granulation tissue (Figure 1c). Now the tooth was held in a sterile gauze sponge and the tooth structure in the region of apical foramen around the wedged instrument was meticulously shaved off which loosened the instrument which was then, gently pulled out (Figure 1d). The remaining distal canal was then prepared with a 60 no. file and filled with radiopaque light-curable GIC (GC Glass ionomer light-cured universal restorative). The root end cavities were then prepared with an inverted cone bur and the retroprep areas were filled with Type 2 resin modified GIC. The entire procedure took 10-15 minutes. During the procedure the periodontal tissue was frequently irrigated with sterile saline. The extraoral time period was 10 minutes after which the tooth was placed back into the socket. The buccal and lingual plates of bone were manually compressed and the patient was asked to bite on a wood stick for a few minutes to stabilize the tooth. The tooth was secured with functional splint, given in the form of orthodontic wire and flowable composite (Figure 1e). The occlusion was adjusted, final radiograph taken and post-operative instructions given (Figure 1f). The patient returned for a follow up after 7 days. The postoperative period was uneventful with no pain and discomfort. Root surface and the replanted tooth appeared intact and the replanted tooth was asymptomatic. At last follow up, after 5 years the patient reported no painful symptomatology. Recall radiograph showed no evidence of root resorption or ankylosis and a normal periodontal ligament space and an intact lamina dura (Figure 1g). A periodontal
FIGURE 1: 1a: Preoperative radiograph showing the fractured instrument; 1b: IOPA showing the obturated canals; 1c: Granulation tissue carefully removed with minimal damage to the walls of the socket; 1d: Extracted tooth & retrieved instrument (inset); 1e: Postoperative showing reimplanted & splinted tooth and final postoperative picture (inset); 1f: Postoperative IOPA radiograph; 1g: Five year recall radiograph shows healing periapical area.
examination showed normal sulcular depth and normal gingiva.

Discussion
Intentional replantation has some advantages over apical surgery, which includes being easier, less invasive, time consuming, less costly procedure. In addition, diagnosis of the defect and its correction is better performed extraorally. The greatest disadvantage of intentional replantation, which leads most dentists to consider this technique as the last resort to save a tooth, is occurrence of replacement resorption or ankylosis.(6,8,9) However, long term studies have shown that incidence of replacement resorption is directly related to the amount of damage to the root surface cells. The viability of the periodontal ligament cells is maintained by atraumatic extraction of the tooth, by minimizing the extraoral time and by keeping the PDL attached to the root surface moist for the entire time the tooth is out of the socket.(9,10) During extraction care should be taken to keep the beaks of the forcep away from the cementum to prevent denuding the important periodontal ligament cells. The most technique sensitive portion of the procedure is to remove the tooth atraumatically in one piece. If the root cracks or tooth fractures during extraction the procedure is terminated and the tooth extracted. Time factor can be controlled by meticulous planning and organization. Everything that the clinician needs should be at his or her disposal. In the authors opinion the extraoral time should not exceed 10 minutes but many investigators believe that even longer time period do not significantly increase the deleterious future outcomes.

Splinting should be done only if required. Semi-rigid splint should be given to allow for physiologic mobility of the tooth and for no longer than a week period which again decreases the chances of replacement resorption.(11) As in this case reported, all care was taken hence no evidence of replacement resorption was later reported. The important thing is to have the expertise and resources to provide this state of the art procedure for the best outcome possible. The follow up of 5 years confirmed the successful management of the case. Kingsburg has estimated success rate of replantation for 3 years is 95%.(12) Most failures occur during the first 2-3 years following replantation. This surgical plan extracts the compromised tooth and replants it in the corrected state preserving the socket integrity, the alveolar bone and also allowing for proprioception during function. IR is becoming a predictable option in contemporary restorative dentistry. In fact, any tooth that can be atraumatically removed in one piece is a potential candidate for intentional replantation.

Conclusion
With proper case selection intentional replantation can provide successful long term results and should be more often used as a viable treatment option to extend the life of a natural tooth for as long as possible in select cases. Moreover with increased understanding of the periodontium, high success rates and improved techniques replantation should no longer be considered as a last resort treatment when all other options of treatment have exhausted but rather a successful and an easy alternative.

References


How to cite this article: