



CASE STUDY

NATURAL TOOTH CONSERVED WITH INTENTIONAL REIMPLANTATION AS PROCEDURAL LAST RESORT: A CASE REPORT

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ABSTRACT

Intentional reimplantation (IR) is an intentional extraction of tooth followed by reinsertion into its own alveolus. In this case report endodontically failed tooth with large periapical radiolucency was chosen for intentional reimplantation in mandibular second molar. After 6 month follows up the patient was asymptomatic and radiographically no evidence of root resorption was seen. The indications for and limitations of intentional reimplantation are discussed in the case report.

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INTRODUCTION

Reimplantation means reinsertion of a tooth in its socket (Grossman, 1966). Intentional Reimplantation (IR) is a surgical procedure involving atraumatic extraction of the offending tooth, root-end resection/preparation/filling and its replacement in its socket (Bender *et al.*, 1993). There are several key factors that have remarkable influence on treatment prognosis including: a) patient factors and physical limitations; b) endodontic and anatomic tooth factors; and c) operator factors; d) Bioavailability and biocompatibility of the root end filling material. Operator factors are the most significant as the practitioner should have the skill and knowledge of atraumatic extractions. (Peer, 2004) Minimum manipulation and damage to the periodontal ligament (PDL), cementum and associated cells keep the cells viable/intact (Penarrocha *et al.*, 2007). In 1890, Scheff addressed importance of periodontal ligament (PDL) prognosis of replanted teeth (Scheff, 1890). In Grossman's publications, IR has been introduced as a last resort and not in routine procedure because its success rate is far below than routine RCT or apical surgery (Grossman, 1989).

Some indications have been proposed for IR, including as follows: a) when routine RCT is impossible or impractical, (b) foreign body, periapical radiolucency, large cyst present in periapical (PA) tissues or PDL and surgery is impractical. (Weine, 1989) In the present case report we have focused on IR in endodontically failed teeth with MTA as root-end filling material.

Case report

A 32 year old female reported to the "Department of Conservative Dentistry and Endodontics with persistent pain and swelling related to tooth # 37. The tooth was treated endodontically twice and restored with metal crown 2 years back. Upon clinical examinations, the tooth was tender to percussion. On radiographic examination (shown Figure 1) failed endodontic treated tooth with large periapical radiolucency in proximity to vital anatomical structure was seen leading to difficulty in access for periradicular surgery. guttapercha point was used to visualize the trajectory of sinus tract as shown in (Figure- 1). All possible treatment options were explained to the patient including i) tooth extraction and replacement, ii) retreatment and c restoration, iii) periradicular surgery, and iv) IR with root-end filling. The risks and benefits of each option were thoroughly explained and the patients were asked to sign a written informed consent.

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Patients were given 400 mg of Ibuprofen preoperatively to prevent postoperative pain. A 0.2% Chlorhexidine mouth rinse was given to control the oral microflora. After achieving complete local anesthesia (2% lidocaine with 1:80000 adrenalin), tooth was extracted atraumatically (Figure 2). During extraoral procedure periodontal tissue and alveolus were frequently irrigated with sterile saline solution. Curettage done in order to remove inflammatory granulation tissue. Extraorally Root end resection and removal of the resorptive defect was performed followed by rootend filling by MTA (angeulus) (Figure-3). Whole procedure took approximately 15 minutes. Thereafter tooth was replanted and secured with orthodontic wire and flowable composite (Figure-5). The occlusion was adjusted in order to ensure that tooth to be free of interface. An intraoral periapical radiograph revealed proper repositioning of the tooth and proper root end filling (Figure-6). The splint was removed after 3 weeks of reimplanatation. Patient had no pain or discomfort during postoperative period Patient reported with mild discomfort at one month follow up. Patient had no pain or discomfort at 3 months. At 6 months, digital imaging revealed healing and no signs of root resorption. Clinically no tenderness on percussion and periodontal probing was found.



Figure 1. IOPA showing gutta percha point tracking sinus #37



Figure 2. Atraumatic extraction of #37 with intact roots and crown



Figure 3. Extraorally Root end resection and rootend filling by MTA (angeulus)



Figure 4. Curettage of granulation tissue from the socket



Figure 5. Tooth was replanted and secured with orthodontic wire and flowable composite



Figure 6. IOPA showing proper repositioning of the tooth and proper root end filling

DISCUSSION

Patient compliance and lack of periodontal disease were important factors in the decision to perform the procedure (Dumsha, 1985). Factors that encourage good prognosis include reduction in extraoral time, atraumatic extraction/reinsertion, adequate apical seal, material compaction and suitable case selection. Extraction and subsequent reinsertion should be atraumatic so as to prevent damage to the buccal/lingual plates of the alveolar bone. The most common causes of failure are external inflammatory resorption or replacement resorption or ankylosis. These complications are caused by damage and necrosis of the PDL and cementum (Lu, 1986). Other causes for failure of IR can be inadequate root-end filling material and root resection. Effective coronal and apical seal prevent re-infection and biomaterials induce healing resulting increase success rate of IR. Nosonowitz and Stanley proposed ten years minimum retention period as a criterion for success (Nosonowitz, 1984). Several properties are necessary when choosing a root-end filling material including sealing ability, antibacterial activity, and more importantly, cementogenesis. Studies have shown that osteoblasts have favorable response to MTA (Nosonowitz, 1984). In a two year follow-up study with MTA as root-end filling material has

shown regeneration of the cementum and ligament cells over itself in animal studies (Baek, 2005). Mineral trioxide aggregate (MTA) has satisfactory properties including: biocompatibility, favorable sealing ability, mechanical strength and a capacity to promote periradicular tissue healing (Kratchman, 2001). Originally developed as a surgical root-end filling material, MTA has been used successfully in several clinical applications such as pulp capping, pulpotomy, perforation repair treatment of traumatized teeth with immature apices and for treatment of root resorptions (Jacobovitz, 2008). Good surgical techniques and protocol are as important for better results as are the root end filling materials

Conclusion

The advantage of IR includes reduction in clinical time, complications and expense compared to non/surgical endodontic (re)treatment. Furthermore, with good case selection, the skilled general practitioner makes IR simpler to perform than endodontic (re)treatment or periradicular surgery. The present case re-emphasizes that intentional replantation modality is a sensitive clinical technique and requires preservation of periodontal ligament.

Clinical significance

IR is less invasive, less time consuming, better accessibility and handles both root end infection and extraradicular infection. It is a reliable and predictable treatment modality to conserve the natural dentition, rather than a last resort to save the tooth.

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