

A 5 Year Follow Up of Intentionally Replanted Tooth- A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. Authors MNH and NDH analysed and carried out the treatment and followed it up. Authors DS and AP assisted during the treatment wrote the first draft of the manuscript and managed the literature searches. All authors read and approved the final manuscript.

Case Study

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ABSTRACT

Intentional replantation can be an alternative choice and to restore an original tooth to function in the mouth instead of replacing it with prosthesis. This case report describes intentional replantation of a maxillary first premolar and its 5 year follow up. A 42-year old woman with the chief complaint of pain and swelling in her gums in the upper right premolar area. Direct digital radiograph revealed the presence of a vertical fracture line with respect to the right maxillary first premolar, extending from the cemento-enamel junction (CEJ) to the middle-third of the root, along with large periapical radiolucency. In view of the patient's objection to undergo surgery, intentional replantation was suggested as an alternative. The patient returned for clinical and radiographic follow-up at 1, 5 months and 1 year and 5 years. At the last visit, after 5 years, no pain and symptoms and normal appearance of periradicular area was evident.

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1. INTRODUCTION

Intentional replantation (IR) is a concept that has been known for over a thousand years. Intentional replantation is defined by Grossman (1966) as the "removal of a tooth and its almost immediate replacement, with the object of obturating the canals apically while the tooth is out of the socket." It is considered by many as a procedure of last resort [1]. In this technique a tooth is intentionally extracted and reinserted into its socket immediately after endodontic treatment and apical repair is done extraorally [2,3].

Indications of performing replantation are small mouth opening and trismus where interocclusal space is less to perform conventional endodontic treatment. There is difficult access in the posterior teeth especially in mandibular molars due to greater bone thickness. Conventional retreatment is not feasible because of obstructions in the canal (i.e posts, separated instruments, impassable ledges or perforation). A surgical approach to the apices is not possible due to anatomic limitations in mandibular molars and due to thickness of bone. Conventional and surgical treatment has failed and tooth is symptomatic. Visibility is inadequate due to uncontrolled haemorrhage, direction of roots and angle of bone, hence root end filing becomes difficult. Root perforation and resorptive defects do not respond to conventional treatment and accidental avulsion (unintentional replantation).

Contraindication of replantation are when patient is medically compromised, tooth is non restorable, pre-existent moderate to severe periodontal disease, curved and flared roots, missing interseptal bone and when patient is not willing for treatment.

Case selection is perhaps the most crucial aspect of replantation. The technique sensitive portion of the treatment is removal of the tooth atraumatically. Tooth with straight roots is an ideal case. The advantage of performing replantation over length surgical procedure is that it is less complicated. The disadvantage is the risk fracture of the tooth and root resorption [4].

2. CASE PRESENTATION

A 42-year old woman reported to the Dental Speciality Clinic, Mangalore with the chief complaint of pain and swelling in her gums in the upper right premolar area. On examination it was noted that a swelling was present on the gingiva with respect to the gingival sulcus area of the right maxillary first premolar (Fig. 1), which was covered by a metal-ceramic crown. Direct digital radiograph at different angulations revealed the presence of a vertical fracture line with respect to the right maxillary first premolar, extending from the cementoenamel junction (CEJ) to the middle-third of the root, along with a large periapical radiolucency (Fig. 2). Treatment options that were presented to the patient and consent obtained for the current treatment plan. Treatment options were intentional replantation and extraction followed by implant placement.

The conventional treatment plan for such a case is extraction. However, as a last resort it was decided to extract the tooth atraumatically, followed by cementation of the fractured segments, cystic enucleation, extraoral endodontic therapy, and replantation of the involved tooth [5]. The crown was first removed (Fig. 3A). The tooth was then atraumatically extracted using Emdent forceps (Fig. 3B). The fracture line was noted (Fig. 4A) and the two segments

were bonded using a gentamycin-containing cyanoacrylate based adhesive material (Palacosg, biomet inc. Warsaw).

Endodontic retreatment was carried out extra orally with re-treatment instruments (Dentsply Maillefer), cleaning and shaping was done by ProTaper files, irrigated with 2% Chlorhexidine solution (Chlorhexidine BP Rexidin) and obturated with greater taper gutta percha points (6% gutta percha points Dentsply Maillefer) (Fig. 4B) and glass ionomer based sealer (KetacEndo, GC Asia) followed by root resection. Following this, retrograde and orthograde filling was done using re-inforced glass-ionomer cement (GC Fuji IX, GC Corporation Tokyo Japan) (Fig. 4C). During the entire procedure, care was taken to handle the periodontal surface as gently as possible with frequent immersion in normal saline solution.

The cyst was then enucleated and the cyst lining removed from the socket (Fig. 5A). Biopsy of the specimen confirmed it to be a radicular cyst. The tooth was repositioned in the socket and then seated in position (Fig. 5B). Splinting was not carried out as the tooth was found to be mobile only upto the extent of having physiological mobility. A post operative radiograph was taken showing the replanted tooth in position (Fig. 5C). Clinical and radiographic follow up were carried out regularly over a period of 5 years at an interval of 1 month, 5 months, 1 year and 5 years (Fig. 6). Patient was asymptomatic and showed adequate periapical healing.

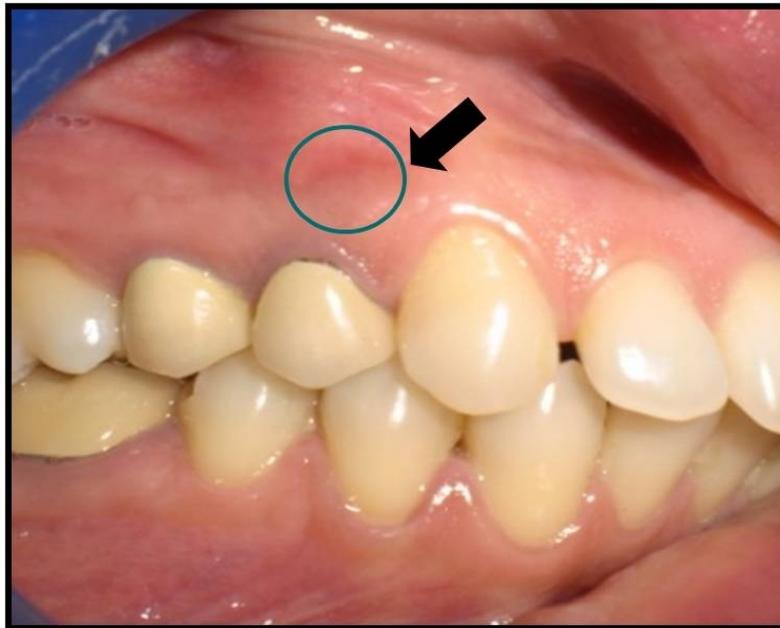


Fig. 1. Swelling on the gingiva with respect to the gingival sulcus area of the right maxillary first premolar



Fig. 2. Direct digital radiograph showing the presence of a vertical fracture line with respect to the right maxillary first premolar, extending from the cemento-enamel junction (CEJ) to the middle-third of the root, along with a large periapical radiolucency



Fig. 3. Porcelain fused to metal crown removed (Fig. 3A). The tooth was then atraumatically extracted using Emdent forceps (Fig. 3B)

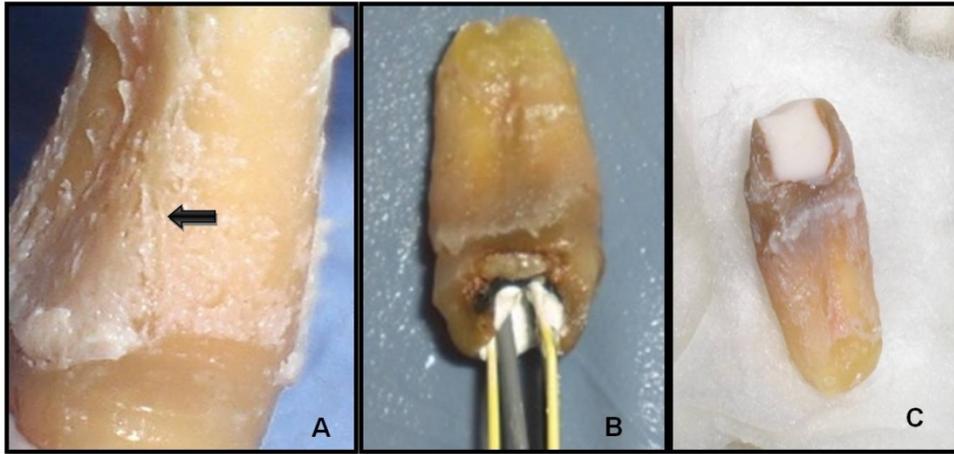


Fig. 4. Endodontic retreatment was carried out extra orally

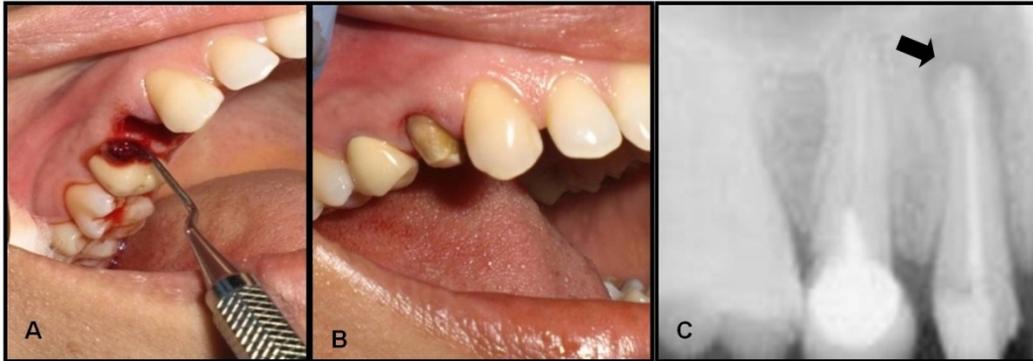


Fig. 5. The cyst was enucleated and the cyst lining removed from the socket (Fig. 5A). The tooth was repositioned in the socket and then seated in position (Fig. 5B and C)

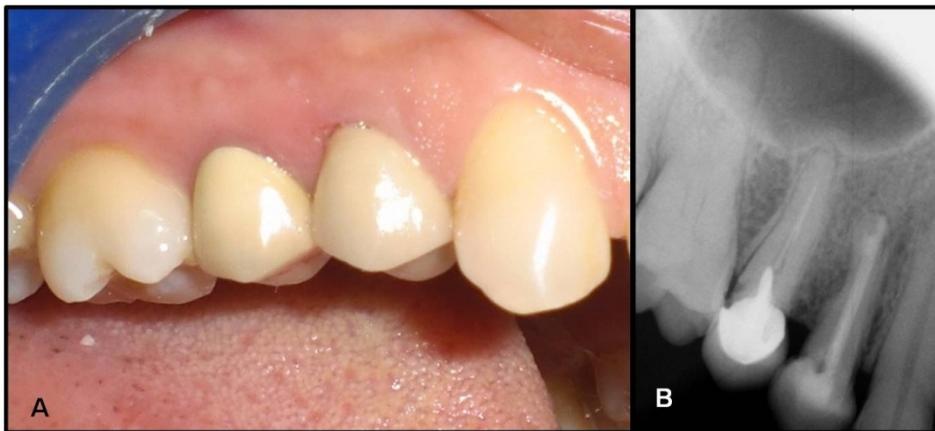


Fig. 6. Post – operative follow up view and radiograph after 5 years

3. DISCUSSION

The preservation of natural dentition is the primary goal of any conservative treatment modality. Although it is not the primary therapy of choice, intentional reimplantation as an alternate treatment should not be underestimated, especially when conventional treatment is not applicable [6]. The success of this treatment primarily depend upon the maintenance of aseptic conditions during the intervention, atraumatic extraction, minimal manipulation of the periodontal ligament, short extra-oral time, minimizing occlusal forces following replantation, as well as carefully controlled postoperative patient compliance [7].

Extra-oral time in this treatment was less than 5 min. Successful completion, according to Kratchman, of extra-oral manipulation should not exceed 10 min [8]. Radiographic analysis, after retrofill and before replantation is an option than can be utilized for further apical evaluation. This radiograph enables the operator to ensure the apical fill adequately extends to the apex. Risks of root resorption, inflammation or by substitution are associated with the Dental Replantation procedures [9].

In the case we described, the patient came to the clinic presenting an unsatisfactory endodontic treatment, chronic pain, and sensitivity to percussion and palpation. Intentional replantation was chosen as the treatment option on the basis of the clinical indication and the patient's refusal to undergo a periapical surgery. CBCT could have been used for diagnosis and prognosis of the periapical lesion, however, CBCT does not help in diagnosis of vertical root fracture in the form of 'fine vertical cracks' at the current CBCT resolutions [10]. The long-term follow-up confirmed the successful management of the case.

4. CONCLUSION

With the high success rate of dental implants and endodontics, intentional replantation is not frequently the treatment of choice. However, in cases where a dental implant, nonsurgical retreatment or surgical treatment is not possible, intentional replantation may be a viable treatment option.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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