

Intentional Re-implantation and Extra-oral Rehabilitation of Endodontically Ill-Treated Mandibular Molar with 36 Months Follow-up: A Case Report

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Abstract

This case report demonstrates intentional extraction of an endodontically compromised tooth followed by its intentional re-implantation to preserve the tooth and restore its functions. Re-implantation presents an alternative treatment option to preserve integrity of dentition in cases of poor prognosis where the tooth is damaged with multiple perforations or due to limited instrument access or proximity to vital structures. This technique can help preserve permanent teeth in pediatric patients for support in the long run. Extraction of tooth eliminates the source of infection and facilitates extra-oral repair of the tooth diminishing the chances of resorption and re-infection when supplemented with Mineral Trioxide Aggregate as a perforation repair material; and triple antibiotic paste and chlorhexidine for adequate sterilization. The tooth is maintained in the oral cavity and its functions of mastication, support and esthetics are preserved. Re-implantation supported by adequate splinting ensures proper bone deposition around the re-implanted tooth, thus, aiding in increasing the life span of the tooth in the arch. Intentional re-implantation has been shown to be a successful treatment modality in cases of endodontic failures to salvage the tooth with excellent follow-up results as in this case.

Key Words: Endodontic failure, Flexible splint, Intentional reimplantation, MTA

Introduction

Conventional root canal treatment is the first choice of treatment for pulpal and periapically inflamed tooth. However, endodontic treatment failures owing to instrument breakage, over-extended or laterally perforated gutta-percha obturation pose challenges to re-root canal treatment and may lead to chronic periapical lesions and further related complications with extraction remaining as the final treatment option. Endodontic surgery is another alternative for endodontically ill-treated tooth; but this procedure is burdensome to perform in molars due to limitations of instrument access, proximity of important structures like maxillary sinus and inferior alveolar canal. Instead of extractions, we can save the tooth and restore its functions by performing intentional re-implantation [1-3]. Intentional re-implantation (IR) is defined as intentional extraction of tooth and its re-insertion into socket after extra-oral endodontic treatment [4].

Case Report

A 15 year old male patient reported to the Department of Pediatric and Preventive Dentistry, ACPM Dental College, Dhule, with pain in his lower right back tooth. Clinically intraoral draining sinus was seen in relation to permanent mandibular right first molar; radiographically, periapically overextended gutta-percha in mesio-buccal and mesio-lingual canals was noted (*Figure 1*). Re-root canal treatment was performed in order to retrieve over-extended gutta-percha from both mesial canals. On exploration, multiple lateral perforations within the two canals were found; owing to which the re-root canal treatment could not be successful. Also, patient factors of reduced mouth opening, unfavorable root position with proximity to inferior alveolar canal and multiple lateral perforations were not in favor of performing endodontic surgery like apicoectomy. Hence, the intentional re-implantation of the tooth was planned.



Figure 1. Over-extended gutta percha point and lateral perforation.

Patient's parents were informed about the procedure and written informed consent was obtained. Firstly, the permanent mandibular right first molar was extracted aseptically and atraumatically with no damage to the cortical and interdental bone. The extracted tooth showed attached granulation tissue around mesial root and over-extended gutta percha points beyond apical foramen in mesial canals. The granulation tissue was scrapped with universal curette and overextended GP points removed with endodontic file and tissue forceps (*Figure 2*).

Bio-mechanical preparation with Hand Protaper file in sequence S1, S2, F1 and F2 with copious irrigation of 2% chlorhexidine was carried out extra-orally. Later canals were dried with paper points and all the lateral perforations sealed with mineral trioxide aggregate (*Figure 3*). All canals were

obtured with F2 GP points using a resin based sealer. Access cavity filling was done with light cure composite.



Figure 2. Tooth extracted and over-extended gutta percha point removed.

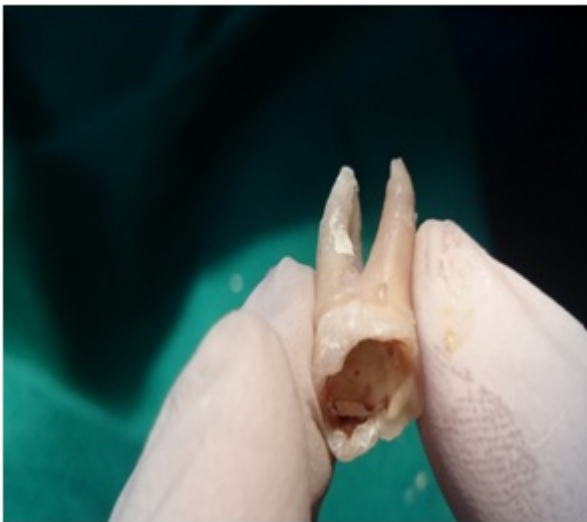


Figure 3. Repair of lateral perforation using MTA.

The socket was prepared by curettage in order to remove the granulation tissue and abscess locules. A2M paste, a medicament composed of a combination of triple antibiotic paste, in 1:1:1 proportion of Ciprofloxacin, Minocycline, and Metronidazole, and prednisolone was placed in the extracted socket. This medicament aided in maintaining an antimicrobial environment alongwith an anti-inflammatory effect. Then the tooth was re-implanted in its original position in the socket and radiograph was obtained to confirm the proper position (*Figure 4*). The re-implanted tooth was splinted using a flexible splint taking support of adjacent teeth- 44, 45 and 47 utilizing light-cure flowable composite. Intact interdental bone aided in better stability of re-implanted tooth in the socket.



Figure 4. Intentionally implanted lower molar.

Follow-up

Patient was advised to take soft diet and maintain proper oral hygiene. He was advised 2% chlorhexidine mouthwash for 15 days. Recall visits were planned after 1 week and monthly follow-up was done for 12 months (*Figure 5*); thereafter at 6 months interval. During follow-up no clinical or radiographic signs of periapical infections were reported. The tooth was found to become stable in the arch with radiographic bone formation around the re-implanted tooth. With 36 months follow-up (*Figure 6*), patient was totally asymptomatic and satisfied with the treatment.



Figure 5. Radiographic bone deposition around re-implanted tooth 12 months post-operatively.



Figure 6. Follow-up after 36 months.

Discussion

The overall success rate of IR (68%) is governed by factors like root end filling material used, location of tooth, oral hygiene, general condition of the patient and periodontal support [1]. In this case report, the current guidelines for IR with maintenance of all aseptic conditions were followed along with use of excellent materials like A2M, triple antibiotic paste, chlorhexidine, mineral trioxide aggregate for favorable prognosis. Also flexible splint was used in order to reestablish PDL function and prevent resorption process. MTA showed high success rate as a root end filling material. The antimicrobial and anti-inflammatory effect of A2M provided faster and better healing of the socket and surrounding tissues with resultant good prognosis. Also, chances of inflammatory resorption were minimized by placing a corticosteroid locally. The entire procedure was completed in a span of 30 minutes with minimal extra-oral time of 15 minutes, which further enhanced the prognosis.

Outcome of treatment may have been influenced by experience and surgical skills of the operator. According to systematic review, the weighted average success rate of surgical endodontic treatment is 75%, although direct comparison between success rates of apical surgery and IR is impractical. In this case apical surgery was not possible due to hindrances like limited mouth opening, unfavorable root position and multiple lateral perforations; hence, we

considered IR as it is reported to show greater success rate of 78% in mandibular molars [5]. Re-implantation presents an alternative treatment option to preserve integrity of dentition in cases of poor prognosis where the tooth is damaged with multiple perforations. This technique can help preserve permanent teeth in pediatric patients for support in the long run.

Extraction of tooth eliminates the source of infection and facilitates extra-oral repair of the tooth diminishing the chances of resorption and re-infection when supplemented with Mineral Trioxide Aggregate as a perforation repair material; and A2M and chlorhexidine for adequate sterilization and anti-inflammatory effect. The tooth is maintained in the oral cavity and its functions of mastication, support and esthetics are preserved. Re-implantation supported by adequate splinting ensures proper bone deposition around the re-implanted tooth, thus, aiding in increasing the life span of the tooth in the arch. Intentional re-implantation has been shown to be a successful treatment modality in cases of endodontic failures to salvage the tooth with excellent follow-up results as in this case.

Ethical Approval

All procedures performed in the case report involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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