

CASE REPORT



Intentional replantation of a tooth with separated instrument: A case report

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Received 10 April 2021;

Accepted: 14 May 2021

doi: 10.15713/ins.ijmdcr.169

How to cite the article:

Shekhawat D, Sharma N, Emmanuel BJ, Narwat S. Intentional replantation of a tooth with separated instrument: A case report. *Int J Med Dent Case Rep* 2021;8:1-3.

Abstract

The term “intentional replantation” refers to the removal of a tooth and its replacement in its socket. When surgical endodontics or traditional root canal treatment cannot be possible, intentional replantation is used as a last resort. Periodontal cell viability, irritant removal, successful apical seal, and procedure performed under a microscope are all factors that determine the effectiveness of intentional replantation. In this article, a case of intentional reimplantation is defined and discussed as a treatment option for a mandibular left first molar that has a separated instrument periapically beyond the apical terminus.

Keywords: Antibiotic paste, Intentional replantation, Mandibular first molar, Mineral trioxide aggregate, Separated instrument

Introduction

Intentional replantation was described by Grossman in 1982 as “the intentional removal of a tooth and its reinsertion into the socket almost immediately after sealing the apical foramina.”^[1] Intentional replantation, according to the Glossary of Endodontic Terms, is “the reinsertion of a tooth into its alveolus after it has been removed for the purpose of performing treatment, such as root end fillings or perforation repair.”^[2]

The most common cause of failure in replanted teeth is root resorption, ankylosis, or replacement resorption, which is directly proportional to the amount of time the tooth is out of the socket during the procedure. Retention rates for replanted teeth differ between 52% and 95%, according to Messkoub.^[3]

The most common cause which leads to complications in endodontic treatment is instrument separation. Fatigue failure, torsional failure, and corrosive failure are all common causes of file separation. When a material is exposed to repetitive stresses, cyclic failure occurs. Torsional failure occurs when an object is twisted with an applied force and a portion of it gets locked, while the remaining continues to rotate till a point is reached where separation of instrument takes place. Corrosive failure occurs when combination of torsional and fatigue failure of an instrument is present with signs of corrosion.^[4]

This case report describes the management of separated instrument in mandibular left first molar by intentional replantation.

Case Report

A 13-year-old male patient presented to the Department of Pedodontics and Preventive dentistry of Rajasthan Dental College and Hospital, Jaipur, Rajasthan, with the chief complaint of throbbing pain in lower left back region for 15 days. The medical history was non-contributory. On intraoral examination, the mandibular left first molar was tender on vertical percussion. The patient gave a history of PFM crown cementation done on #36. Pre-operative radiographs revealed involvement of distal pulp horn. Periapical radiolucency was seen with mesial root apices [Figure 1]. A diagnosis of symptomatic apical periodontitis was made.

Conventional root canal treatment was planned and local anesthesia was administered with 2% lignocaine hydrochloride in 1:80,000 adrenaline. Access cavity preparation done and working length was taken. During biomechanical preparation, 20 no. file was separated in mesiolingual root of the right mandibular first molar. Periapical radiograph was taken to know the position of separated instrument [Figure 2].

The parent of patient was informed about the separated instrument. The side effects of keeping it untouched since it was protruding beyond apex were explained. The patient was also explained about the different techniques with which attempts were explained in detail. Informed consent for intentional replantation was obtained. First, the permanent mandibular left 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 overextended separated instrument beyond apical foramen in mesiolingual canal. The granulation tissue was scrapped with universal curette and overextended instrument was removed with tissue forceps. Roots were coated with antibiotic paste and root canal treatment was done extraorally within 15 min to maintain periodontal ligament (PDL) viability and retrograde filling was done with mineral trioxide aggregate (MTA). The length of separated instrument was 4 mm [Figures 3 and 4].

The tooth was then washed with sterile saline and replanted into its socket. Following this, suturing was done in figure of 8 around the tooth and post-operative radiograph was taken to confirm the position of the tooth [Figure 5]. Recall after 7 days,

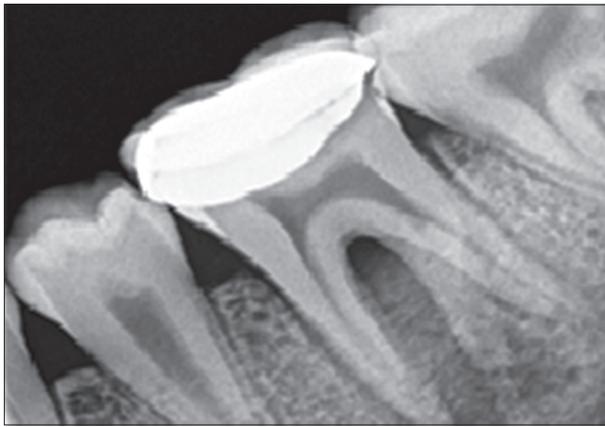


Figure 1: Pre-operative radiograph

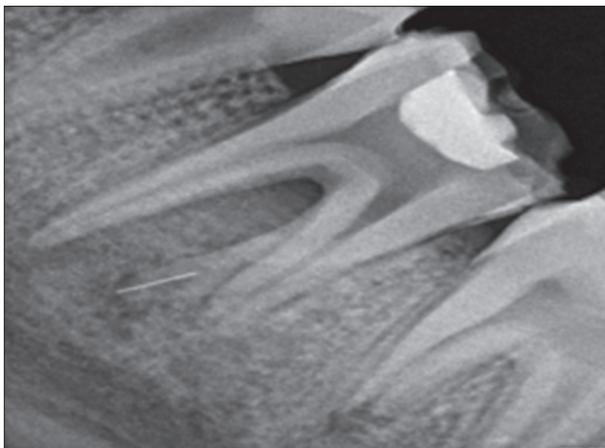


Figure 2: Broken file fragment

3 months, 6 months, 9 months, and 1 year was done. No clinical and radiographic abnormalities were detected. The patient was given oral hygiene instructions and asked to rinse with 0.12% of CHX solution (Hexidine, ICPA Health Products Ltd., Mumbai, India) twice daily for 1 week, due to its antibacterial properties. Antibiotic coverage was given 3 times daily for 5 days and the patient was advised soft diet. One week later, the suture was removed. The tooth was stable in its socket without any clinical sign of tenderness and pathologic mobility. Periodic evaluation was done after 7 days, 1 month, 6 months, and 9 months and followed by placement of stainless steel crown by 1 year [Figure 6].

Discussion

One of the most important aspects of endodontic treatment is cleaning and shaping. Ledging, zipping, canal perforation, canal transportation, and instrument separation are examples of procedural errors that may occur during cleaning and shaping.^[5]

Instrument separation is most commonly caused by inappropriate usage, physical property limits, insufficient access, root canal anatomy, and manufacturing defects.^[6]

In cases such as unsuccessful root canal therapies, developmental defects, anatomic limitations, access

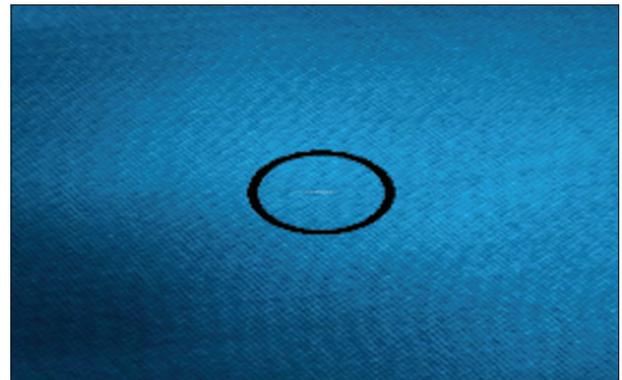


Figure 3: File fragment (4 mm)



Figure 4: Retrograde filling with mineral trioxide aggregate

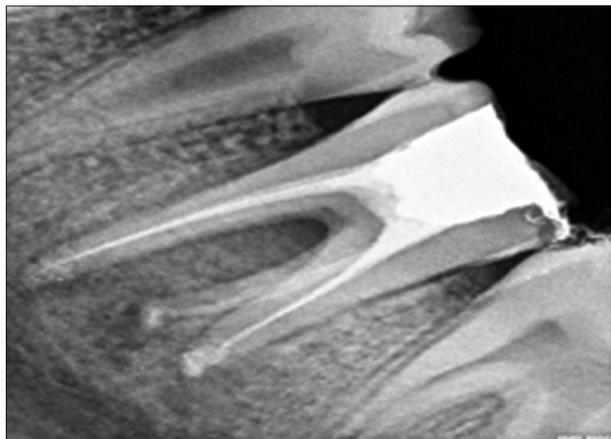


Figure 5: Reimplantation of tooth in socket



Figure 6: Stainless steel crown cementation after 12 months

problems, accidental exarticulation, patients with operation objections, and trismus, intentional replantation is suggested. Because of the thick overlying buccal bone, shallow vestibular depth, and proximity of the root apices to the mandibular canal, the mandibular first molar was intentionally replanted in this case.

The tooth also had convergent roots, which allowed for atraumatic extraction without causing too much root damage.^[7]

Antibiotic paste was coated on roots of molar to preserve the viability of the PDL cells and prevent resorption and ankylosis of the tooth. Elevators should not be used during extraction, and the forceps' beaks should be positioned coronal to the cement-enamel junction. Since drying of PDL cells takes 8 min or more, the extraoral time should be kept to a bare minimum. The risk of bony ankylosis increases as the extraoral time increases.^[8]

Jang *et al.* found that teeth with an extraoral period of 15 min or less had a higher success rate than teeth with an extraoral time of more than 15 min.^[9]

The root end of the tooth was resected and retrofilled with MTA in this situation. MTA was chosen as a retrograde material because of its biocompatibility, low toxicity and pulpal irritation,

moderate periapical inflammation, non-mutagenicity, and ability to form a dentinal bridge.^[10]

The presence of healthy cementum on the root surface is important in the prevention of tooth ankylosis. Several solutions, such as tetracycline, citric acid, and ethylenediaminetetraacetic acid, are used to create a root surface that is conducive to cellular adhesion and growth. In this case, minocycline was applied to the root surfaces to increase PDL fiber attachment and prevent ankylosis of the tooth.^[11]

Conclusion

Conventional endodontic surgery, intentional replantation, or tooth extraction are some of the treatment options available in the event of an extruded instrument or root canal filling. Material surgical option or intentional replantation may be considered based on different parameters and indications. In cases where traditional endodontic retreatment or surgical endodontics is not possible, intentional replantation is recommended.

If proper case selection and protocol are followed, it can be a reliable and predictable procedure.

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