

Intentional re-implantation in a left mandibular second molar with broken file in apical third of mesiobuccal root: A case report

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Abstract

Intentional re-implantation is done in cases of endodontic failures where conventional treatment options either fail or cannot be carried out due to any reason. It involves extraction of the offending tooth, extra oral apicectomy, followed by reinsertion of the tooth into its anatomical location. The following case report presents a situation where an endodontic instrument was separated in the mesiobuccal root of the left mandibular second molar during instrumentation that could not be retrieved. The decision of intentional re-implantation was made after detailed discussion with the patient, weighing pros and cons of each available treatment option. Fortunately, a favourable outcome was observed over a span of one year and the patient is still on follow-up for evaluation of long-term prognosis.

Keywords: Intentional re-implantation, Apicectomy, Broken file.

DOI: <https://doi.org/10.47391/JPMA.4774>

Introduction

Separation of endodontic instruments is woefully a typical procedural error in dental practice. At the point when the instrument breaks during the procedure in the root canal, the most ideal choice is to eliminate it.¹ In 1982, Grossman² defined intentional re-implantation as "a purposeful removal of the tooth and its reinsertion into the socket almost immediately after sealing the apical foramen." Pierre Fauchard, in 1972 proposed intentional replantation, after 15 minutes of extraction.³

In dental practice, instrument separation is the most common cause which leads to many complications in endodontic treatment. Common causes which lead to instrument separation are torsional failure, corrosive failure, and fatigue failure.³ Intentional replantation has been recommended as an option in contrast to routine extraction; it is a moderate treatment methodology that aims to protect the regular tooth. Numerous authors accept that it should be performed after different

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techniques have failed or are prone to fail to save a tooth.¹ The primary reason for failure in replanted tooth is root resorption, replacement, and specifically ankylosis. This is directly related to the length of time the tooth is out of the mouth during the procedure. The current article depicts a clinical case wherein intentional replantation was chosen as a treatment approach to eliminate an instrument that had separated beyond the apex and relieve the continuing symptoms.

Case Report

A 34-year-old male patient presented in the Department of Operative Dentistry of the Islamic International Dental Hospital, Islamabad, on November 21, 2019 with the complaint of moderate to severe pain in the lower left posterior region in the past one week. Upon clinical examination, the left mandibular second molar was noted to be carious with caries encroaching the pulp chamber and the tooth was tender to percussion. After vitality testing and radiological examination, the diagnosis of irreversible pulpitis was made. Non-surgical root canal treatment was proposed and agreed upon as treatment plan and informed consent was obtained from the patient.

Conventional root canal treatment was initiated under

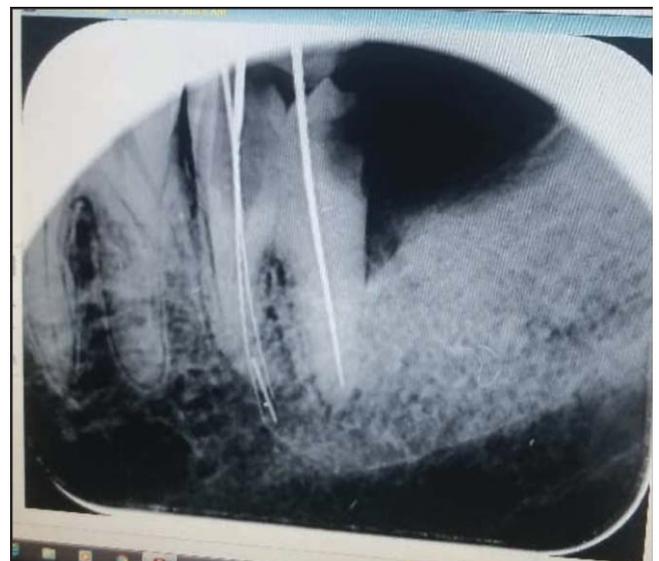


Figure-1: Periapical radiograph showing the separated instrument in the mesiobuccal root being by-passed by #10K file.

local anaesthesia (2% Lidocaine with 1:100,000 Epinephrine) as inferior alveolar nerve block. After establishment of local anaesthesia, rubber dam was applied for isolation. After removing the caries, access cavity was prepared and initial working length was determined. Unfortunately, during the initial canal preparation, the stainless steel #25K file was separated in the apical third of mesiobuccal root. Radiographs were taken using SLOB (same lingual opposite buccal) technique to determine the location and extent of the separated file in the canal. Unluckily, it was extending 3mm beyond the apex. The patient was informed about the separated instrument. As the file could not be retrieved because of its location in the canal, attempts were made to bypass it. Fortunately, the file was successfully bypassed with stainless steel #10 K file (Figure-1).

Treatment options for the broken file: The patient was informed about the prognosis and the treatment options including root resection, periradicular surgery, intentional replantation, and extraction. Since the root was in close proximity to the inferior alveolar nerve, root resection and periradicular surgery could have been potentially harmful to the nerve. However, the patient was motivated to salvage the tooth. Therefore, intentional replantation was decided as the most suitable treatment modality and the patient also agreed.

Steps of the procedure: According to the decided treatment plan, before the extraction of the tooth.



Figure-2: Periapical radiograph verifying working length with master cones prior to obturation.



Figure-3: Clinical picture showing the extruded separated instrument in the tooth immediately after extraction, prior to re-implantation.

conventional root canal treatment was completed after bypassing the file successfully and the tooth was obturated at 0.5mm from the radiographic apex after verifying the working length (Figure-2).

The tooth was carefully extracted (Figure-3) under local anaesthesia using elevators and mandibular molar forceps. Extraction was uneventful and the roots were intact. The extended file was retrieved from the apical third of the mesiobuccal root using tweezers. The mesiobuccal root end was prepared using ultrasonic diamond tip number (RG 2)-. Bio dentine (septodont) was used to retrofill the prepared root end which had not been resected.

The extra oral dry time was less than five minutes. The tooth was positioned back into the socket using slight digital pressure. Its position in the alveolar socket was verified using post-operative periapical radiograph and it was the same as its pre-operative position. Mobility of the



Figure-4: Follow-up periapical radiograph after one year showing adequate periapical healing consistent with a favourable outcome.

tooth was evaluated as grade I, so splinting was not carried out. The coronal access cavity was sealed using glass ionomer cement (Fuji) as temporary restorative material.

The patient was prescribed antibiotics for five days after re-implantation and he was instructed to take analgesics as required. Soft diet was recommended for a few days and the patient was asked not to chew from the treated site. Smoking was also discouraged and the importance of follow-up was emphasised.

Immediate post-operative symptoms were mild swelling and dull pain which was managed by analgesics and the symptoms resolved in three to four days.

The two-week follow-up showed a complete resolution of the symptoms. The periapical radiograph also revealed absence of periapical pathology (Figure-4).

Discussion

This case report depicts a rarely experienced procedure known as intentional replantation, which can be utilised to oversee complexities that cannot be appropriately managed with the periradicular surgery. In any case, this method should be considered if all else fails and should be restricted to cases which are generally considered for extraction. With good case selection, intentional replantation is easier than non-surgical endodontic treatment, making it an accessible choice for a talented general practitioner.⁴ Early resorptive processes are analysed within the initial two to three years. However, although uncommon, most recent resorptive procedures could happen even after five or 10 years.⁵

Cleaning and shaping are among the significant steps in endodontic treatment. Procedural mistakes occurring during cleaning and shaping might be zipping, ledging, canal transportation, canal perforation, and instrument separation.⁶ The success rate of the separated instrument management depends on the anatomy of the root canal and location of the fragment. The described incidence of hand instrument separation is 0.25%, and for rotary instruments it goes from 1.68% to 2.4%.⁷ Treatment methodology fluctuates depending upon the area of instrument separation. If the broken instrument is situated at the apical third and it appears that it can be bypassed, this technique ought to be utilised as the recovery might be related with the risk of root damage. If it is located in the coronal or middle third and straight-line access is achievable then removal should be tried. When attempting retrieval, different factors have to be taken into consideration such as root curvature, length, technique of removal, dentine thickness, presence or

absence of periapical radiolucency, length of the fragment, and stage of preparation when instrument separation took place.⁸

The fruitful result of this treatment relies basically on the maintenance of aseptic conditions and restricted extra-oral time, endurance of periodontal ligament cells on the root surface and delicate atraumatic extraction with minimal manipulation of the socket. These periodontal cells can be kept crucial when the tooth is out of the socket by keeping the tooth humid and in sterile condition. During extraction, care should be taken to keep the beaks of the forceps far from the cementum to prevent shedding of the significant periodontal ligament cells. The most fragile part of the procedure is to separate the tooth atraumatically in one piece. If the root or tooth cracks during extraction, the procedure is finished and the tooth removed. Splinting of the tooth for about two weeks as demonstrated can increase healing and support of the tooth when mobility is available.⁹

Although the success rate of this treatment is high, it is essential to follow the procedural guidelines. The ideal root end filling material satisfies specific properties. It should have a biocompatibility, good sealing ability, antibacterial activity and cementogenesis. Despite the fact that the ideal material still hasn't been discovered, MTA has been acknowledged as quite possibly the most appropriate materials utilised in apicoectomy procedures.¹⁰ A few case reports propose that intentional replantation is a reliable technique and the degree of consistency of the teeth after replantation is high even after more than 10-year follow-up.¹¹ Intentional replantation is a moderate treatment that ought to be considered before tooth extraction to keep up the natural dentition.

Conclusion

Intentional reimplantation is an elective treatment which might be proposed for specific situations when routine treatment cannot be attempted or has fizzled out, where periapical surgery would either be unfeasible or rejected by the patient or is unlikely to succeed. In such circumstances, however, long-term monitoring is required to ensure success. This case report shows that intentional re-implantation gave favourable results.

Consent: Consent of the patients was obtained for publishing his case.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Funding Sources: None to declare.

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