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Case Report

Intentional Replantation – The novel technique for the management of separated instrument in apical third of tooth: A case report

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ABSTRACT

Intentional replantation is a procedure in which an intentional tooth extraction is performed followed by reinsertion of the extracted tooth into its own alveolus. In this article, intentional replantation is described and discussed as a treatment approach for failed root canal treatment with broken instrument periapically in mandibular second molar.

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1. Introduction

Root canal treatment is successful treatment modality to retain diseased tooth in form and function in the oral cavity. Still there are failures, the most common reason has been said to be persistence of micro-organisms within the complexities of the root canal system. Other probable possibilities for failure could be incomplete debridement of root canal system, foreign body reactions to overfilled root canals, and the presence of cysts. Conventional root canal therapy alone is not helpful in every situation. Cases with ledge formation, instrument separation, calcifications, limited access, anatomical limitations, and perforations in areas not accessible to surgery, failed apical surgery and persistent chronic pain where non-surgical or surgical root

canal therapy (RCT) is not possible or impractical. In these situations, intentional replantation may be served as one of the treatment option for preserving the tooth.¹

Glossary of Endodontic terms defines intentional replantation as “insertion of a tooth into its alveolus after the tooth has been extracted for the purpose of performing treatment, such as root end fillings or perforation repair”.²

Bender and Rossman reported 81% success rate with the follow up of 22 years.³

With a more frequent use of nickel titanium rotary files in Endodontics, the incidence of file separation within the canals has increased. When the file is separated at the apex, the microscope is not of much use.⁴ Separation rates of SS instruments have been reported to range between 0.25% and 6%, the separation rate of NiTi rotary instruments has been reported to range between 1.3% and 10.0%.⁵ Common causes of file separation are fatigue failure, torsional failure

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and corrosive failure. When material is subjected to repeated stresses, it results in cyclic failure. Torsional failure occurs when an object is twisted and a portion of it gets locked and the remaining part continues to rotate till a point is reached where separation of instrument takes place. Corrosive failure is the result of combination of torsional and fatigue failure of an instrument presenting with signs of corrosion.⁶

This case report describes a case of intentional replantation of a symptomatic mandibular second molar with non-retrievable separated instrument in apical part of mesiobuccal & mesiolingual canal.

2. Case Report

A 40 year old female reported to the department of Conservative dentistry & Endodontics with chief complaint of persistent pain in lower right back tooth. She was suffering from the pain soon after the completion of pulp space therapy of that tooth. Upon clinical examination tooth number 47 was tender to percussion, so radiograph was advised with tooth number 47. Radiograph showed completed root canal treatment with tooth 47 & overextended separated instruments in mesiobuccal and mesiolingual canal [Fig-1]. Periapical surgery, intentional replantation & extraction were suggested as treatment options with their advantages, possible associated risk and consequences for tooth 47. Patient declined to go with periapical surgery & extraction as a treatment option however she gave her consent for intentional replantation. Hence being second most conservative option, intentional replantation was selected as treatment of choice for this particular case. After obtaining verbal & written consent from patient, her appointment was scheduled on next day under antibiotic coverage.



Fig. 1: Pre-operative radiograph

2.1. Intentional replantation procedure

0.2% Chlorhexidine had been given as pre procedural rinse. Right inferior alveolar & long buccal nerve block had been

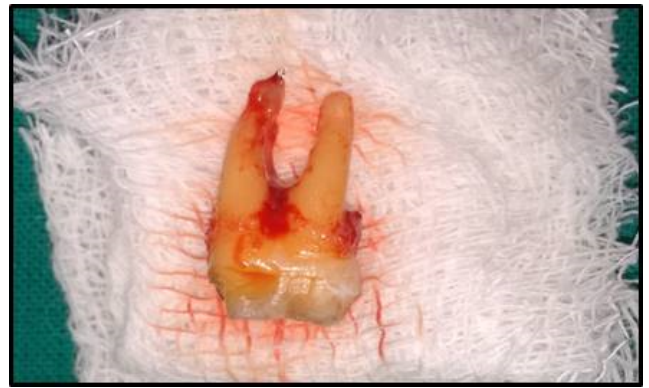


Fig. 2: Extracted tooth

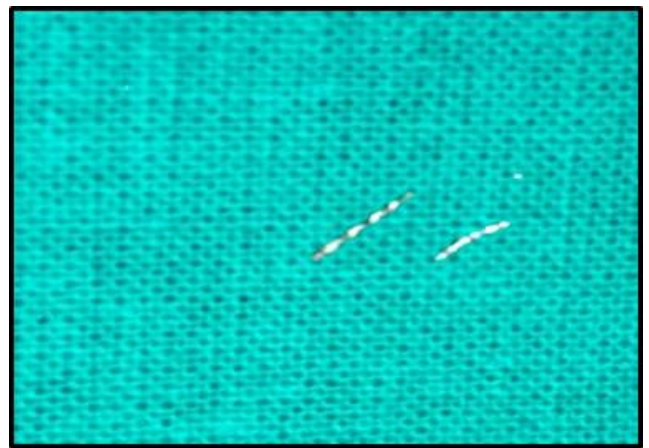


Fig. 3: Separated instrument

given with 2% lignocaine hydrochloride with 1:2,00,000 adrenaline to anesthetize the operational area. Tooth 47 was luxated & extracted atraumatically (Figure 2). Care was taken to avoid touching the root surface to maintain the viability of periodontal tissues. The apical part of the tooth was resected along with separated instrument (Figure 3) and apicectomy & retrograde preparation done (Figure 4) and retro filling with Mineral Trioxide Aggregate (Figure 5). The root surface was irrigated intermittently with storage media to avoid dehydration of the periodontal ligament. Simultaneously extraction socket was gently curated, then tooth was replanted back into socket. Splinting was done with ligature wire (Figure 6) for 3 weeks and patient was kept on periodic follow up. Extra oral time was recorded which was 8 minutes.

Postoperative medication & instructions were given. After three weeks the splint was removed and the patient was asymptomatic. The patient was placed on 6 months recall for two years. After two years the patient was completely free of symptoms. Percussion was negative and elicited a normal sound. A periapical film showed no evidence of root resorption after two years (Figure 7), and



Fig. 4: Apicectomy & retrograde preparation

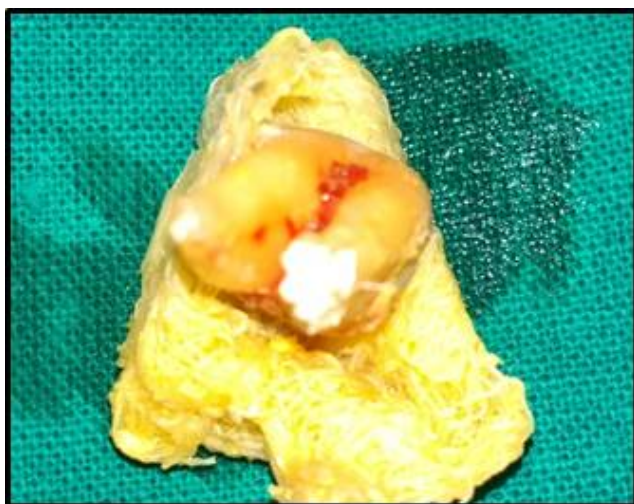


Fig. 5: Retrograde filling with MTA

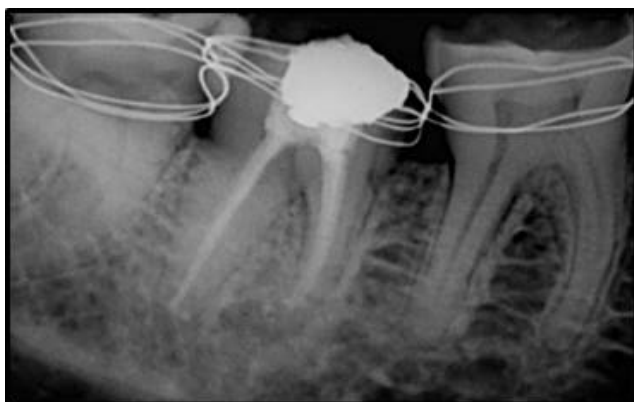


Fig. 6: Splinting with ligature wire

the root surface and periodontal ligament appeared intact.



Fig. 7: 2 year follow up

3. Discussion

Intentional replantation procedure has been advantageous when periapical surgery is refused, because of less operational time & minimally invasive procedure. While it is the treatment of choice in cases with limited access, anatomical limitations, and perforations in the inaccessible areas also in failed apical surgery and persistent chronic pain as reported by Kratchman.⁷

With proper case selection, the procedure is simple and straightforward. The present case has been selected for intentional replantation as cited by Dryden and Arens. They stated that refusal of the patient for periapical surgery is a viable indication for the intentional replantation.⁸ Also there are less chance of damage of vital structures adjacent to the teeth. The mesial root of tooth has slight curvature while distal root is straight which made the extraction and the manipulation during the procedure simple and less time consuming. In the present case reports, the tooth was outside the mouth approximately 8 minutes, manipulation was kept minimal, and the periodontal ligament was not removed since viability of periodontal ligament has significant role in prognosis of replanted tooth as suggested by Scheff⁹ in 1890 & Hammer¹⁰ in 1955. In the present case, tooth was stabilized by ligature wire as suggested by Abulcasis.¹¹ Follow up of the present case has been taken for 2 years to evaluate any sign of resorption or ankylosis, which was not seen in this case. The result was similar to study by Sherman in 1968 where they showed that normal periodontal ligament could be re-established following intentional replantation.¹² On the contrary Deed in 1965 and Edwards in 1966 noticed resorption repaired with cementum in teeth with intentional replantation.¹³ Desire to save the tooth was made with all these issues in the mind, fortunately to date; this procedure resulted in the continued retention of tooth in this case.

4. Source of Funding

None.

5. Conflict of Interest

The authors declare no conflict of interest.

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