

INTENTIONAL RE-IMPLANTATION-A VIABLE TREATMENT OPTION¹ Kartik Poonja¹ Senior Lecturer² Suraj Arjun Ahuja² Postgraduate³ Mahesh Sonar³ Senior Lecturer⁴ Rafeeq Nalaband⁴ Senior Lecturer⁵ Tanvi Bhagat⁵ In private practise

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ABSTRACT: Intentional re-implantation is a procedure in which a tooth is intentionally extracted and then reinserted into its own socket for various treatment modalities. In this case report, we discuss a case of intentional re-implantation as a treatment option for failed root canal treatment with broken instrument in the apical 1/3rd of a maxillary first molar. A follow up for 2 year revealed the patient to be asymptomatic, the tooth to be sound and functional with no evidence of root resorption.

KEY WORDS: Intentional re-implantation, Surgical Endodontics, Broken instrument

INTRODUCTION

Intentional re-implantation was defined by Grossman as the purposeful removal of a tooth and its reinsertion into the socket almost immediately after sealing the apical foramina.¹ He also stated that it is the act of deliberately removing a tooth and following examination, diagnosis, endodontic manipulation, and repair—returning the tooth to its original socket to correct an apparent clinical or radiographic endodontic failure.²

It is considered by many as a procedure of last resort. The indications for intentional replantation include failed previous nonsurgical endodontics, an apicoectomy procedure is unfavorable because of anatomical factors (e.g. buccal plate thickness, proximity to anatomical structures such as the mandibular nerve or inoperable sites such as lingual surfaces of mandibular molars) or financial factors preclude conventional implant placement. Buccal plate thickness may preclude surgical endodontic treatment in mandibular molars and the palatal root of maxillary molars³. Although post removal is frequently possible in the hands of a skilled clinician, occasionally posts or separated instrument removal may pose risks greater than the potential benefits as compared with other options including extraction⁴. If executed correctly it is a one-stage treatment that would maintain the natural tooth esthetics⁵.

Case Report:

A 26 year old male reported with a chief complaint of slight pain in the upper left back region of jaw since two weeks. The dental history revealed that patient was apparently alright 1 month back when he experienced pain

with a tooth in the upper left back region of jaw for which root canal treatment had been initiated with 26 after which was discontinued by the patient. When patient reported to us 26 had a temporary restoration and was sensitive to apical palpation and percussion. Radiographic examination showed aradiopaque structure at the apex of the apical 1/3rd of the mesiobuccal root of 26 suggestive of an endodontic instrument separation (**Fig.1**).

The patient was presented with the treatment options of extraction and a dental implant or extraction with no replacement. Endodontic retreatment and implant therapy were declined by the patient. After understanding risks and benefits of all treatment options, the patient made an informed decision to have the tooth removed. Upon the patient's decision to have the tooth extracted, the treatment option of intentional replantation with associated risks and benefits was offered. The patient accepted this treatment modality.

The patient was prepared for surgery and profound posterior superior alveolar nerve block, greater palatine nerve block and local infiltration was used to achieve anesthesia with 2% lidocaine containing 1:100,000 epinephrine. 26 was extracted as atraumatically as possible using forceps technique (**Fig.2A**). Thereafter using a sterile gauze sponge, the tooth was held by the crown and the broken instrument was carefully taken out (**Fig. 2B**). Root canal treatment was completed extra orally. The tooth and alveolus were then irrigated with sterile saline, the socket was not curetted to prevent



Fig. 1: IOPA showing 26 showing a radiopaque structure at the apex of the apical 1/3rd of the mesial root of 26 suggestive of an endodontic instrument separation.

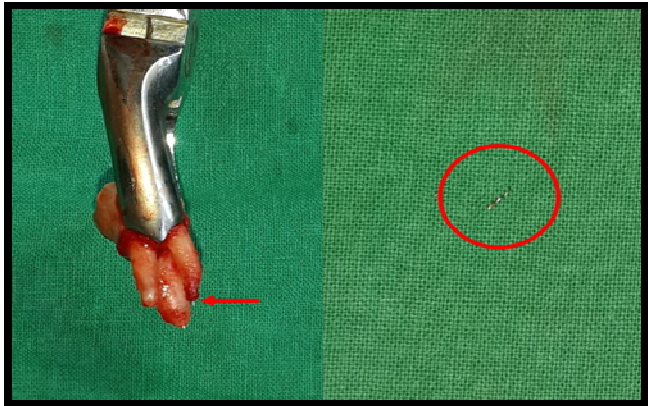


Fig. 2A & 2B: 2A-Atraumatically extracted 26 showing file at the apex of mesiobuccal root; 2B-Endodontic file retrieved.

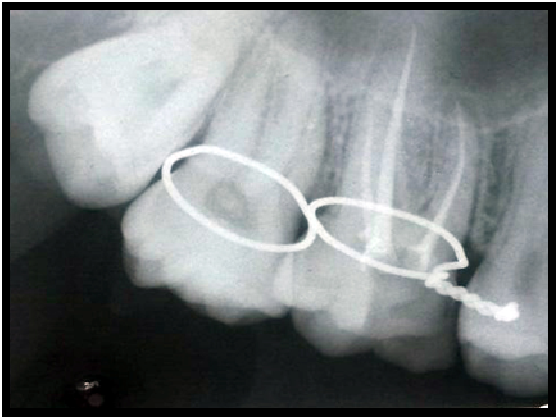


Fig. 3: Tooth re-implanted in its own socket and splinted with interproximal wire ligature.



Fig. 4: Splint removed after 4 weeks of re-implantation.

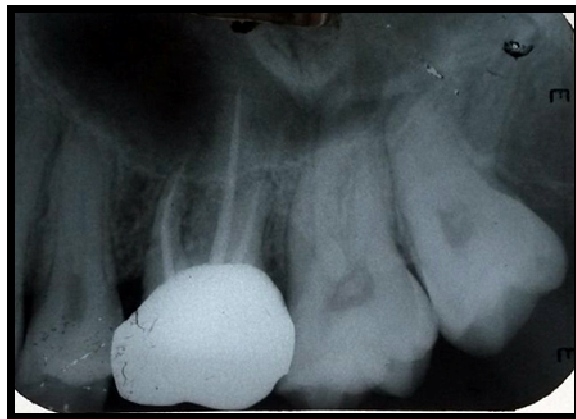


Fig. 3: Two year follow-up of the tooth, sound and functional with no evidence of root resorption.

damage to parts of remaining PDL attached to the socket wall and the tooth was replanted into its socket. The procedure took 14 minutes. Interproximal wire ligature splinting was done to stabilize the tooth using a 26G stainless steel wire. The occlusion was adjusted on that tooth. A postoperative radiograph was taken (**Fig. 3**) and the following postoperative instructions were given: chlorhexidine gluconate 0.12% rinse three times per day after meals for 7 days, cap amoxicillin 500mg *tds* for 5 days, ibuprofen 600 mg every 4 to 6 h for 48 h and soft diet for 2 week. The patient was recalled in 1 week for evaluation of the surgical site. The splint was removed after 4 weeks of re-implantation (**Fig. 4**). Patient had no pain or discomfort during postoperative period. After 6 months the patient was asymptomatic, percussion was negative and IOPA revealed healing and there was no signs of resorption. There was no pathological condition, good gingival health and no periodontal pocket. Prosthetic rehabilitation was done using a metal crown, a follow up for 2 year revealed the patient to be asymptomatic, the tooth to be sound and functional with no evidence of root resorption (**Fig. 5**).

Discussion

Intentional replantation should no longer be considered a last resort treatment prescribed to hope less teeth⁶, as Grossman phrased it² and certainly not as a procedure with the poorest prognosis as Weine viewed it⁷. Long term studies show that success rate of IR are somewhat similar to those apical surgery^{8,9}, although recent studies tend to favor apical surgery^{10,11}.

As reported by Kratchman⁹, there are some advantages in performing intentional re-implantation when periapical surgery is refused. The procedure is typically less time consuming and invasive as compared to periapical surgery. He reported that indications included limited access, anatomical limitations, and perforations in areas not accessible to surgery, failed apical surgery and persistent chronic pain. With proper case selection, the procedure is simple and straightforward. There is less chance of damage of vital structures adjacent to the teeth. Thus in our case due to anatomical limitations (proximity of maxillary sinus) a preapical surgery could not be undertaken and hence the decision of IR was thought upon.

In intentionally replanted teeth, the most common causes of failure are external inflammatory resorption or replacement resorption and ankylosis caused by PDL damage and further necrosis of the PDL and cementum.^{9,12,13}

The replacement resorption is influenced by the extraalveolar time while the inflammatory resorption is caused by infection after an improper RCT.^{14,15,16} Also, ankylosis may be due to the removal of pericementum, the splinting and a long extra-alveolar period.^{10,14}

It is found that resorption of the root may occur even after 10 years.¹⁷ Prevalence for resorption without visible contamination after 2 years is 57%. The success or failure of the IR depends on vitality of PDL cells¹⁸ these cells can be kept vital while the tooth is out of the socket but kept moist, for at least 15 to 20 minutes. Resultantly, moistening the PDL with solutions such as saline solution, seems to prolong the vitality of PDL cells.^{14,19}

CONCLUSION

Intentional re-plantation might serve as a treatment modality with predictable outcome for certain cases when routine treatment cannot be undertaken or has failed, where periapical surgery cannot be performed due to anatomical and an alternative to extraction. Although this method has a satisfactory success rate, long-term follow-up is necessary to evaluate reliability of this technique.

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