



# Intentional Replantation in a Maxillary Molar with Undesirable Root Fracture: A Case Report

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## ABSTRACT:

Intentional replantation is done in cases of endodontic failures where conventional forms of treatment options either fail or become impossible. It involves the removal of the offended tooth, execution of extra oral apicoectomy followed by its reinsertion into the socket. The present cases reports demonstrates a scenario where a maxillary left first molar had a separated endodontic file extending beyond the apex that could not be retrieved. The decision of intentional reimplantation was made but unfortunately, the tooth underwent fracture in the course of extraction. The procedure was still performed with a reduced palatal root length. Fortunately, a favorable outcome was observed. However, for recording the long term survival, the patient is kept on follow-up.

**KEYWORDS:** Endodontic failure, endodontic surgery, intentional reimplantation.

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## INTRODUCTION

The advent of rotary NiTi files has resulted in an undesirable increase in the incidence of instrument separation.<sup>1</sup> The prevalence of rotary endodontic instrument separation ranges between 5-21%.<sup>2, 3</sup> Such complication is clinically dealt with the attempt to retrieve the separated instrument, bypassing the separated instrument or leaving the separated instrument in situ.<sup>4</sup> However, at times there are clinical scenarios in which clinicians are left with no choice other than attempting extraction or intentional replantation.<sup>5, 6</sup>

Intentional replantation is considered when the conventional forms of treatment options either fail or become impossible.<sup>7</sup> It involves the removal of the offended tooth, execution of extra oral apicoectomy followed by its reinsertion into the socket.<sup>8</sup> According to Cho *et al.*,<sup>6</sup> the 12-year survival rate of intentional implantation teeth is 93% with 77% healing rate; however, the prognosis mainly depends upon the case selection and technique. The factors

that should be considered while opting for this procedure includes patient, tooth and operator related factors.<sup>9</sup> Intentional replantation is favoured in cases of endodontic failures where periradicular surgery is not feasible due to anatomic limitations or poor accessibility. Teeth having flared curved roots or with compromised crown should not be attempted for this procedure.<sup>10</sup>

Since there is a minimal soft and hard tissue injury, the postoperative healing is usually uneventful.<sup>10</sup> The following case report describes the intentional replantation of a maxillary first molar which was otherwise suggested for extraction due to complications in the primary endodontic treatment.

## CASE REPORT

A 30-year old otherwise healthy female presented to the Aga Khan University Hospital dental clinics with the complaint of moderate pain on chewing in the upper left posterior tooth since last two months. On clinical examination, tooth #26 (FDI) was found to be carious and tender on percussion. Radiographic examination revealed occlusal caries in tooth # 26 (FDI) encroaching upon the mesial pulp horn. Sensibility testing was carried out with electronic pulp tester (Gentle pulse, Parkell, USA) that

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exhibited non-vitality in the affected tooth. Based upon the clinical and radiographic examination, the diagnosis of necrotic pulp with acute apical periodontitis was made. Two treatment options were proposed to the patient: 1. Conventional root canal treatment followed by full coverage crown; 2. Extraction of tooth followed by prosthetic replacement. After detailed discussion regarding the treatment option, the patient opted for root canal treatment of the affected tooth.

### CASE MANAGEMENT

Informed consent was taken before the procedure. Root canal treatment was initiated under local anesthesia (2% lidocaine with 1:100,000 epinephrine) as a buccal infiltrate. The access cavity was prepared after removing the caries. Unfortunately during the initial preparation of the apical third of mesio-buccal canal, the rotary instrument (ProTaper, F1) got separated. Radiographs were taken using SLOB (same lingual opposite buccal) technique to determine the location and extent of separated file in the canal. Regrettably, it was extending 3mm beyond the apex. (Fig. 1) Patient was informed about the separation of instrument.

It was highly unlikely to retrieve the separated instrument from a non-surgical approach. The patient was told about the prognosis and the management options including root resection, periradicular surgery, intentional replantation and extraction. Since, maxillary sinus was closely related to the apex of #26, hence periradicular surgery or root resection would have been a potentially harmful undertaking. Also, the intentional replantation of maxillary molar involved the risk of fracture of root. Thus, extraction of the offending tooth was advised. The benefits and risks involved in the procedure were explained. After a detailed discussion, she consented for the procedure.

The extraction of tooth was attempted under local anesthesia using elevators and maxillary molar extraction forceps. However, despite of careful execution of the procedure, the apical third of palatal root got fractured. The fractured fragment was immediately removed using No. 40 H-File without damaging the socket. Tooth was inspected for any other fracture, crack or abnormality on the root surface. Although, the palatal root was fractured in the apical third, the tooth still had half of the palatal root substance left intact. It offered chances for attempting intentional replantation. Procedure for the intentional replantation was explained to the patient and as the patient was highly motivated and adamant in salvaging the tooth, she requested to select this management modality to maximize her chances of retaining the tooth. Procedure for intentional replantation was then followed.



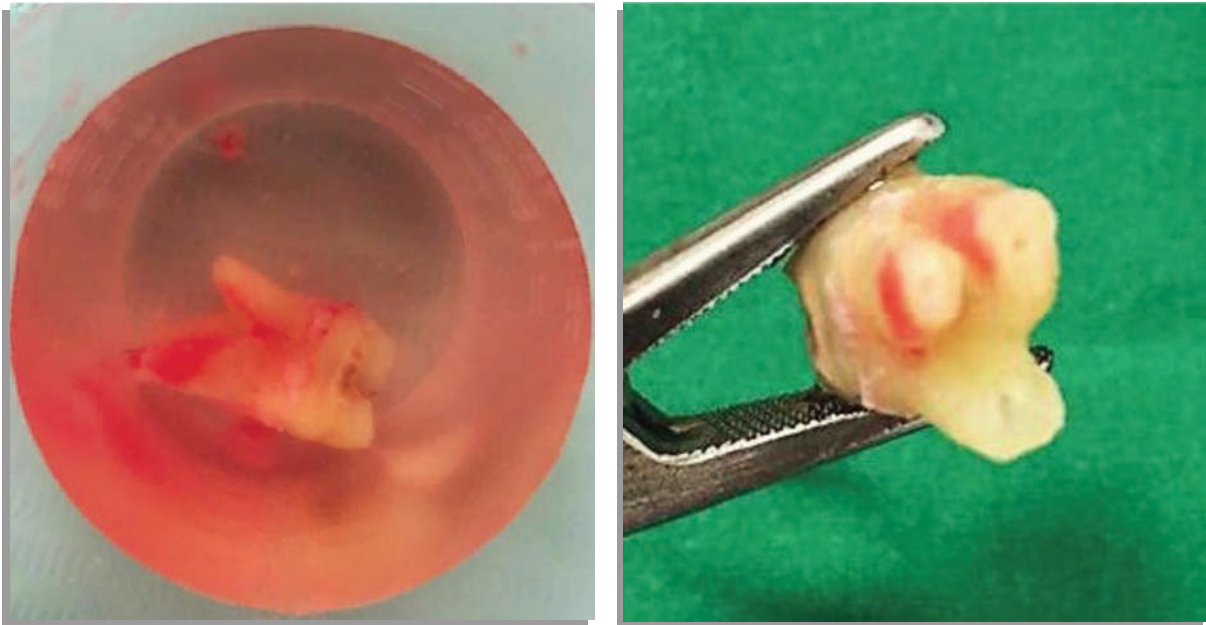
Fig. (1). Radiograph showing separated instrument.

Extra oral apicectomy was carried out in all three roots and apical areas were prepared with ultrasonic tip. A ZnO based intermediate restorative material (IRM, Dentsply, USA) was used to retrofill the resected apices. (Fig. 2) The broken instrument during all this procedure was pushed towards the pulp chamber, so that it could easily be retrieved later. The extra oral time was kept less than 15 minutes. The tooth was placed back into the socket using slight digital pressure and splinted using 0.7mm stainless steel wire and composite resin. Post-operative radiograph was taken to assess the position of replanted tooth and it was found to be in the desired position. (Fig. 3) Patient was followed up at 2 and 4 weeks. The symptoms showed gradual resolution. On the subsequent visit, the fragment of separated instrument was retrieved; obturation was done using protaper gutta percha points. Build up restoration was done with amalgam and the splint was removed. (Figure 4) The challenge was to obturate the disto-buccal canal as some kind of calcification or canal obliteration had taken place. Therefore, it was obturated well short of apex as further pushing of instrument could have resulted in the loss of apical plug.

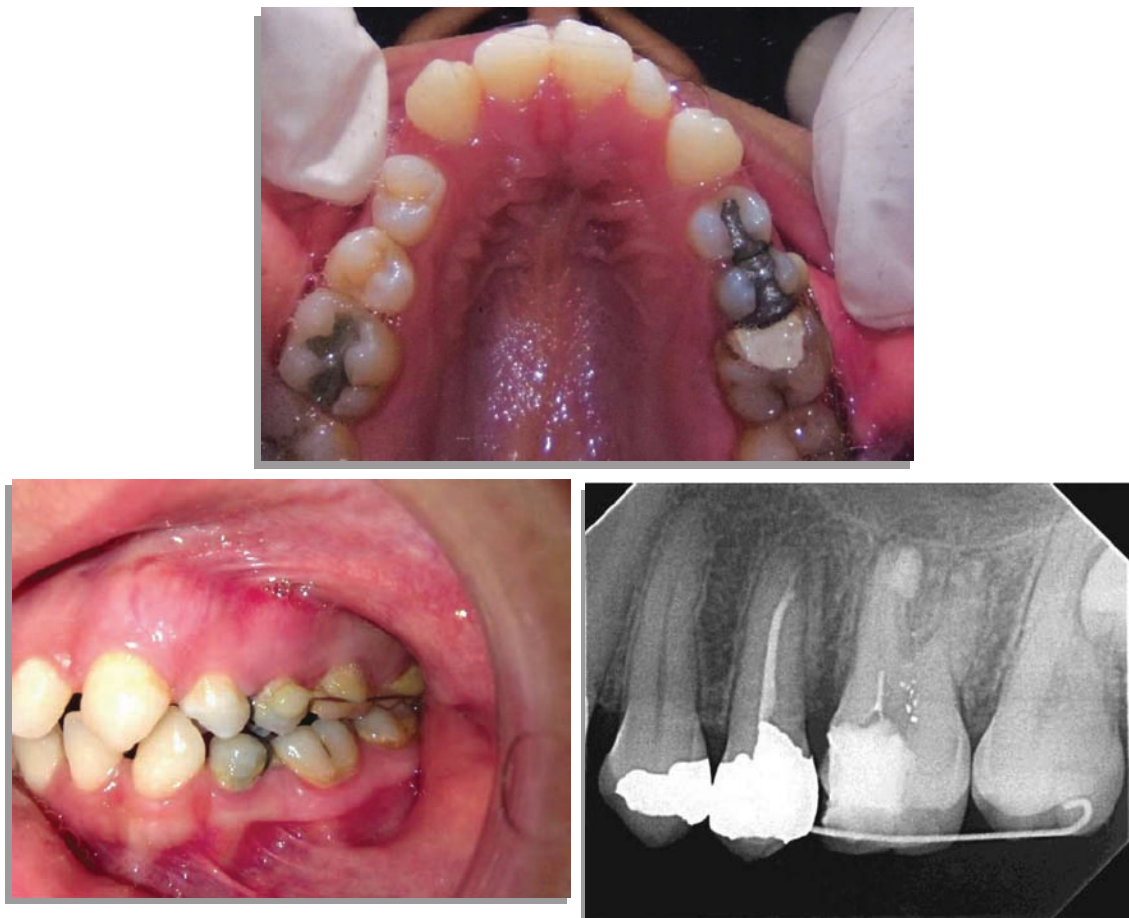
### DISCUSSION

This case report describes an infrequently encountered approach namely intentional replantation, which can be used to manage complications that cannot be suitably dealt with the periradicular surgery. However, this technique should be considered as a last resort and should be limited to the cases which are otherwise deemed for extraction.

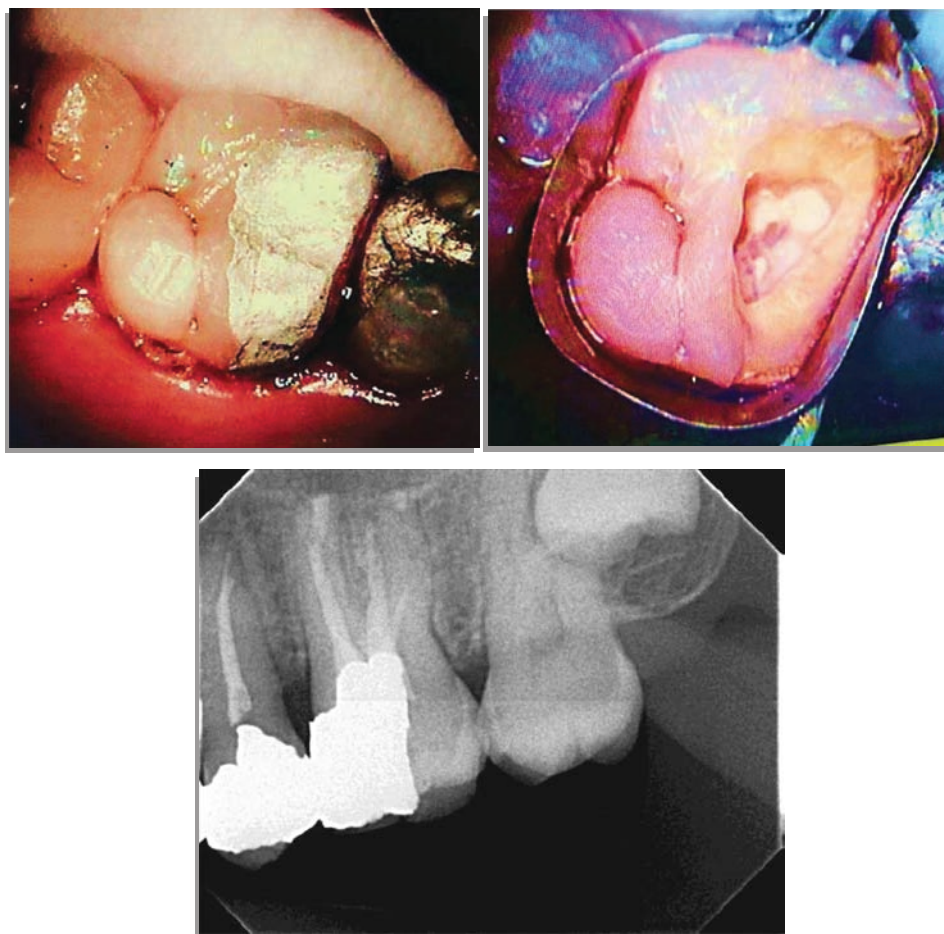
Intentional replantation carries the risk of fracture of the affected tooth during extraction. Moreover; extended extra



**Fig. (2).** Extracted tooth in storage media and extra oral apico-ectomy.



**Fig. (3).** Tooth replanted into the socket and splinted.



**Fig. (4).** Tooth after obturation and amalgam core buildup.

oral time and extent of the damage to the periodontal ligament and cementum during extraction adversely affects the outcome. Therefore, careful planning is necessary.<sup>11</sup> If not appropriately managed, it can lead to progressive root resorption or ankylosis.<sup>6, 10</sup> In our case, the palatal root got fractured during extraction; this was an alarming event as this could adversely affect the prognosis of the reimplantation. However, we decided to proceed with plan. We managed to remove the apical fragment without damaging the alveolus and completed the procedure within short time.<sup>6</sup> The literature suggests that if extra oral time is less than 15 minutes, the results of reimplantation are superior.<sup>6</sup>

Root end filling is also an important factor in the long term survival of teeth. In our case, we had used IRM, although MTA (mineral trioxide aggregate) is presently considered as the gold standard for root end fillings. The Superior biocompatibility, sealing ability and capability to promote periradicular healing has made it favorite among all available root-end restorative materials.<sup>12</sup> However, it is

also noted that MTA has low initial compressive strength and a longer setting time, therefore, the pumping action that can occur at the root apex during the replantation procedure may result in the washout of unset MTA.

## CONCLUSIONS

Intentional replantation is a treatment option that can be exercised in select cases. The present case demonstrates that this procedure works even after fracture of tooth root. However, long term follow-up is needed in such cases to monitor the success.

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