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## **Immediate restorative rehabilitation of fractured tooth by fragment reattachment: A case report**

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**Abstract---**Dental trauma commonly leads to fracture of anterior teeth which affects the aesthetics and even has a psychological impact on the patient. Management of crown fractures depends on multiple factors like extent, pattern and the restorability of fracture to maintain

the occlusion, aesthetics, and prognosis. If the fractured fragment is available, re-attachment is the most feasible option which is simple and economic providing good and long-lasting aesthetics, maintaining the original morphology and colour. This case report shows management of complex coronal tooth fracture by tooth fragment reattachment using metal post.

**Keywords**---tooth fracture, fragment, reattachment.

## Introduction

Coronal fractures of the anterior teeth are common sequelae of dental trauma. Trauma involving the enamel, dentin, and pulp constitute complicated crown fractures. Maxillary central incisors are the most commonly affected teeth in the oral cavity.<sup>1</sup> In case of complicated fractures where the fractured segment is available and closely approximating, root canal treatment (RCT) followed by reattachment of the fractured segment with post reinforcement is considered as a favourable treatment option.<sup>2</sup> Tooth fragment reattachment is a most conservative approach with minimal tooth preparation without loss of tooth structure. Use of direct composite in such cases is questionable because of many issues like retention and longevity.<sup>3</sup> This paper reports a case of complicated coronal tooth fracture successfully managed by tooth fragment reattachment using metal post.

## Case report

A 20 years old male patient reported with fractured upper right central incisor. Patient gave a history of road traffic accident. Patient was in acute pain. On clinical examination a complicated oblique crown fracture was seen on 11 that extended sub gingivally in the mesiopalatal aspect. The fractured segment was held in place by the gingival attachment (Figure1: Pre-operative photograph). No mobility of the remaining tooth was recorded and surrounding intraoral soft tissues were normal. The patient was explained the procedure of fragment reattachment and written consent was taken. Periapical radiographs revealed Ellis Class III fracture with 11 with intact periodontal ligament space, complete root formation with no extrusion of the tooth, and no root fracture (Figure 2: Pre-operative IOPA). Medical history was non-significant.



Figure 1. Pre-operative photograph



Figure 2. Preoperative radiograph

Local anaesthesia was administered (1.0 cc of lidocaine 2% with 1:80,000 epinephrine) and the fractured fragment was removed (Figure: 3). Extracted fragment was washed thoroughly under running water and stored in sterile normal saline to prevent dehydration and discoloration.



Figure 3. Fractured Fragment removed

Access preparation was done and also Straight-line access was ensured. Working length was estimated with Romiapex A-15 (Romidan, Israel) apexlocator. Digital radiograph was taken to assure working length (Figure 4). Biomechanical preparation was completed up to size ProTaper F4 (Dentsply Sirona, Ballaigues, Switzerland). 3% Sodium hypochlorite and 17% EDTA (Ethylenediamine-tetraacetic acid) were used alternatively for irrigation during the canal preparation. 2% chlorhexidine was used as the final irrigant. The root canal was dried with paper points. Obturation (Figure 5 - Obturation RVG) was done by warm vertical compaction technique using F4 size guttapercha, AH plus sealer (Maillefer, Dentsply, Konstanz, Germany) and System B device (Analytic Sybron Dental Specialties, Orange, CA, USA).

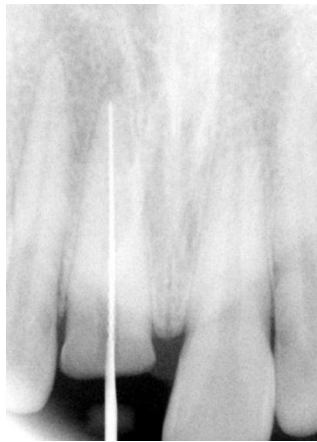


Figure 4. Working length determination



Figure 5. Obturation

Root canal was prepared for the post placement by removing the guttapercha till the half of root length considering the availability of metal post using passo reamers. Access preparation was done in crown segment which was removed earlier. The corresponding metal post was tried in the canal and checked using radiograph. On confirming its fit, the post was cemented using Glass Ionmer luting cement. The tooth and the fractured fragment were approximated and bevels were placed to enhance the retention. The alignment of the coronal fragment was verified with the post in place. The tooth was then etched with 37% ortho phosphoric acid, rinsed, and blot-dried with paper points, and bonding agent was applied. Similarly inner portion of the coronal fragment was etched and bonding agent was applied. The fractured fragment was reattached to tooth using flowable composite resin (Ivoclar Vivadent) after proper shade matching.



Figure 6. Post cementation Digital radiograph



Figure 7. Postoperative photograph

## Discussion

Fractured tooth can be restored by several methods including partial and full coverage crowns, laminate veneers, and composite resins etc. These techniques are expensive, not conservative and need multiple dental visits. Chosack and Eidelman in 1964 described restoration of fractured teeth using the fragment establishes the natural shape, contour and colour.<sup>4</sup> The success of the reattachment is multifactorial: depends on hydration of the fractured segment, fractured level, time duration etc which affect the vitality and original aesthetic appearance of the tooth.<sup>5</sup> The fractured fragment re-attachment ensures better fit, aesthetic recontouring and less chair time and better results.<sup>6</sup> The hydration of the fragment in the case was maintained by storage in sterile isotonic saline.

Rigid posts are an appropriate choice for teeth with less than 3 to 4 mm of vertical height or when less than 25% of the tooth structure remains. However, teeth with minimal tooth structure above the tissue for a ferrule need additional cervical stiffness for a more rigid post to resist distortion from the force. In the absence of the cervical tooth structure, excessive flexibility can result in micromovement of

the core and coronal leakage.<sup>7</sup> Hence after endodontic treatment, intraradicular rigid metal post is used, with the aim of reinforcing the tooth structure.<sup>8</sup> Advances in adhesive systems and composites, have improvised the bonding technology helping in excellent results with reattachment of tooth fragments provided that the biological factors, materials, and techniques are logically assessed and managed.<sup>9</sup> Fragment reattachment becomes a fast, simple, and conservative technique that provides excellent rehabilitation of the aesthetics and function.<sup>10</sup>

## **Conclusion**

Fragment reattachment technique is a reliable, conservative and immediate procedure having better retentive and esthetic values.

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## **Patients' consent**

Informed consent was taken from the participant.

## **Conflict of interest**

The authors declared no conflict of interest.

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