

Biological and Aesthetic Tooth Fragment Reattachment: A Case Report

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ABSTRACT

Tooth fractures are one of the most common reported emergencies in dental practise and amongst fractures, crown root type of fractures are one of the most challenging to treat. Traumatized anterior teeth require quick functional and esthetic repair. If the fractured tooth fragment is available and patient reported early with a fractured segment in a clean and hydrated state then reattachment of the tooth fragment is the most conservative and biological therapeutic option for such fractures and therefore should be considered as one of the treatment modalities. The exposure of the fracture line in case of subgingival fracture can be done either by Gingivectomy, surgical or orthodontic extrusion of apical fragment to provide better isolation. The use of a post and the original crown fragment appears to offer satisfying aesthetic and functional results and is less invasive than traditional prosthodontic treatment to treat traumatized anterior teeth.

INTRODUCTION

Crown fractures are common traumatic injuries, primarily affecting the anterior teeth, with maxillary incisors being the most frequently impacted due to their position in the dental arch^{1,2}. These fractures are especially prevalent in children and young adults, accounting for 18–22% of all dental injuries, with 96% involving maxillary central incisors, while mandibular central incisors are less commonly affected³. The main causes of crown and crown-root fractures in permanent teeth include falls (40%) and contact sports (20%), with automobile accidents and foreign objects striking the teeth accounting for the remainder⁴.

Reattaching a fractured tooth fragment is a viable option for managing coronal fractures, particularly when there is minimal disruption to the biological width and the fragment is intact. This method preserves the tooth's natural anatomy, color, and texture, offering excellent aesthetics and a positive psychological outcome. It is a straightforward procedure that provides more predictable long-term wear compared to direct composite restorations⁵.

This article presents a case of coronal tooth fracture successfully treated through tooth fragment reattachment combined with post insertion.

CASE REPORT

A 24-year-old female reported to the out-patient department of Conservative dentistry and endodontics, for seeking treatment for her traumatized upper front tooth which occurred due to an accidental fall 5 hours before reporting to the department. Clinical and radiographic examination revealed oblique fracture (Ellis class III) in the gingival third regions of the crown of maxillary right central incisor (Figure 1 and 2).



Figure 1- Preoperative clinical view

Figure 2- Preoperative radiograph

Patient was in acute pain and had tenderness on percussion. The coronal tooth fragment was mobile and had grade III mobility and hence, the mobile fragment was detached. No mobility of the remaining tooth was recorded and surrounding intraoral soft tissues were normal (Figure 3). The removed fractured fragment was washed thoroughly under running water and stored in sterile normal saline to prevent dehydration and discoloration.



Figure 3- Removal of mobile fractured segment

Root canal treatment was performed immediately, followed by obturation using the sectional method to maintain a 5 mm apical seal. After creating the post space with a peeso reamer, a prefabricated metal post was inserted and cemented in place using glass ionomer cement. (Figure 4)



Figure 4 – Post insertion

Prior to reattaching the fractured segment, a gingivectomy was carried out with electrocautery to expose the tooth structure, facilitating isolation and achieving hemostasis. (Figure 5). A hole was made on the palatal side of the fractured tooth fragment, which was then etched with 37% phosphoric acid, rinsed, and blot dried. A bonding agent (3M ESPE Adper easy self-etch) was applied, followed by the placement of flowable composite (3M™ Filtek™ Supreme Flowable Restorative) to fill both the access cavity and the hole in the tooth, as well as the prepared grooves in the coronal fragment.



Figure 5- Gingivectomy with electrocautery

The fragment was carefully reattached to the remaining tooth and light-cured. Composite veneering was done on the labial surface to reinforce and strengthen the tooth. Finishing and polishing of the composite was done using 3M Sof-Lex discs. (Figure 6 and 7)



Figure 6- Fracture Reattachment



Figure 7- Post operative Radiograph

Follow-up examinations were performed at 6- and 12-months intervals, and the tooth remained stable, with normal aesthetics and function. (Figure 8)

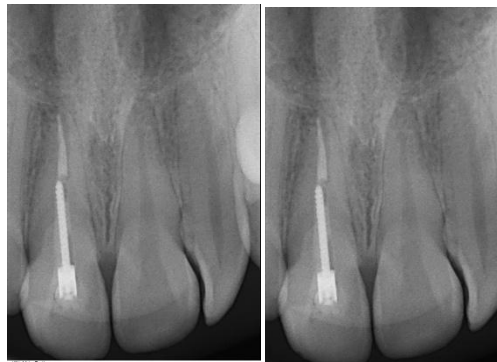


Figure 8- Follow up radiograph at 6 and 12 months

DISCUSSION

Using natural tooth material avoids issues like differential wear, shade mismatch, and difficulties in contour and texture reproduction seen with other methods. The treatment plan is based on evaluating the periodontal, endodontic, coronal, and occlusal status⁶. If the fracture line is supragingival, reattachment is simple. For subgingival or intraosseous fractures, orthodontic extrusion with a post-retained crown may be needed. Alternatively, surgical options like electrosurgery, tissue flap elevation, or crown lengthening with alveolar bone removal can provide access for bonding. When the fracture invades the biologic width, surgery should aim for minimal osteotomy and osteoplasty⁷. Success rates for reattached fragments have been reported to reach up to 90%, based on periodontal health, pulpal condition, and color match, with follow-up periods extending up to 24 months⁸.

In this case, a conservative approach was employed, reattaching the fractured fragments with the addition of a post for enhanced retention, similar to many previously reported cases⁹⁻¹². The post ensures excellent retention and long-term stability of the restored segment.

CONCLUSION

Reattachment technique is the most conservative and biological method of restoring a fractured tooth. If an intact tooth fragment is present after trauma, the reattachment procedure presents a conservative, simple, esthetic, and economical treatment option, but long term follow up is necessary in order to predict the durability of the tooth-adhesive-fragment complex. The need of the day is to educate the population to preserve fractured segment and seek immediate dental treatment.

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