

## Reattachment of Coronal Tooth Fragment an Aesthetic, Biological Restoration: Regaining Back to Normal

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### Abstract

Dental trauma frequently takes the form of anterior teeth's coronal fractures. Following a fracture, the original tooth fragment is kept. Reattaching the broken piece to the remaining tooth can improve function, aesthetics, and psychological reaction. It is also a quicker and less difficult process. The coronal tooth fracture case described in this research was effectively treated by adhesive reattachment of the fractured fragment and post implantation.

#### 1. Introduction:

Traumatic tooth fractures are a reason to visit the dentist. Between the ages of 2 and 5 and 8 and 15, dental injuries most commonly happen. Boys are more likely to experience them than girls because of the active participation of boys in extracurricular activities. Trauma is brought on by falls as well as auto, motorbike, and bicycle accidents. About 45% of all trauma cases involve the maxillary incisors. This is as a result of their anterior placement and protrusion brought on by the eruptive morphology. Coronal

fractures of permanent incisors account for 18–25% of all trauma to dental hard tissues, with simple fractures (enamel and dentin) making up 28–40% and complicated fractures (enamel, dentin, and pulp) accounting for 11–18% of all fractures.

The maxillary incisors are primarily affected by coronal fractures of the anterior teeth because of their position in the arch. The location of the fracture, the size of the fragmented fragments, periodontal health, root maturation, biological width invasion, and occlusion are factors that influence how coronal tooth fractures are managed.<sup>2</sup>

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In 40% of cases, the fracture line runs from the labial to the lingual side of the traumatised incisors. The worst case scenario for a young patient is anterior tooth trauma, which requires prompt attention due to the potential psychological effects it may have on the patient and parents in addition to the potential damage to the dentition. For the restoration of fractured teeth, a variety of procedures and technologies have been used, such as porcelain jacket crowns, orthodontic bands, and pin retained resin. All of these restorations needed extensive tooth preparation and weren't attractive enough. They are ineligible for usage in urgent cosmetic situations. This study details a case series of coronal tooth fractures that were effectively treated with post insertion and tooth fragment reattachment.<sup>3</sup>

Composites made of resin are now able to be reattached because to recent advancements in implantation methods and adhesive protocols. The initial person to employ the acid etch procedure to rejoin a broken tooth piece. Reattachment allows for the restoration of the fragment's natural shape, contour, translucency, surface texture, and colour as well as the patient's favourable emotional and social reaction to the preservation of natural tooth structure.<sup>4</sup>

Coronal tooth fracture care is affected by a number of factors, including<sup>5</sup>:

1. Extent of fracture.
2. Pattern of fracture.
3. Secondary injuries.
4. Presence/absence of tooth fragment and its condition for use.
5. Occlusion, aesthetics and prognosis.

## Clinical assessment<sup>6</sup>:

**Periodontal assessment:** It is possible to assess the degree of the tooth fracture and the presence of a vertical root fracture by gently probing the periodontal tissues of the broken tooth while under local anaesthetic. Since the reattachment operation will be simple due to the supragingival nature of the fracture line. Orthodontic extrusion of the apical section is required to restore the fracture site, which is subgingival or intraosseous.

**Endodontic assessment:** Vitality tests should be used to examine the status of apex maturation, the vitality of the pulp, and clinical evaluation for pulpal exposure..

**Coronal assessment:** There are numerous pieces. Before trying the components in the mouth, it could be essential to combine the pieces using resin composite.\

**Occlusal assessment:** The occlusion can either be traumatic or not. Disoccluding the teeth in cases of traumatic occlusion is indicated. The goal of this case series is to demonstrate a conservative technique for the treatment of coronal tooth fractures employing an original tooth fragment and a glass-fibre-reinforced composite post.

## 2. Case Presentation

Case 1: After an accident 3 days prior, a 24-year-old male patient arrived in agony and with a fractured front tooth (figure 1). The patient showed a fractured, traumatised piece of a detachable tooth. Upon clinical examination, it was determined that 11 had a class III fracture, with the fracture line obliquely extending from the labial side of the tooth's gingival third to the subgingival palatally (figure 2). A scan revealed complete root growth, a closed apex, no periapical radiolucency, and no further fractures or damage to the neighbouring teeth (figure 3). The urgent endodontic treatment of tooth 11 and the reassembly of the damaged crown component were included in the treatment plan.



Figure 1: Preoperative Photograph

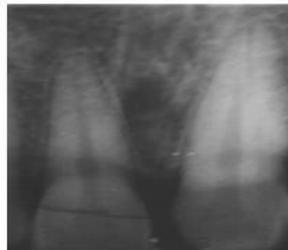


Figure 2 Preoperative Radiograph



Figure 3 After fragment removal

**Case 2:** In the morning of the same day, a 28-year-old male patient who had been in an accident appeared with a fractured front tooth. A class III fracture was found by clinical examination in 12 cases, with the fracture line obliquely extending from the labial aspect of the tooth's gingival third to the subgingival

palatally (figure 4,5). An intraoral examination indicated that the palatal periodontal tissues were still holding the shattered fragment in place. A radiograph (figure 6) revealed complete root growth, a closed apex, no periapical radiolucency, and no further fractures or damage to the neighbouring tooth.



Figure 4: Preoperative photograph



Figure 5 Tooth fragment



Figure 6 Preoperative Radiograph

## Treatment

**Case 1:** After cleaning and shaping, lateral compaction was used to seal the root canals using gutta-percha and resin-based sealant. A glass-fibre-reinforced composite root canal post was then inserted into the canal after the gutta-percha had been partially removed, leaving the apical 4-5 mm of the filling to

preserve a good seal (figure 7).

According to the manufacturer's recommendations, a glass-fibre-reinforced composite root canal post (White Fibre Post, Mother Dental) and a dual-cure luting system (3M Espe Relyx U200) were inserted one after the other.



Figure 7 Post space preparation performed



Figure 8 Post placement



Figure 9 Post operative

The intact coronal section of the tooth and the original crown piece were both etched with 37% phosphoric acid gel for 15 seconds, washed for 10 seconds, and dried. A trough was then made in the centre of the original crown fragment. The entire coronal area of the tooth as well as the remaining piece of the original crown were both filled with flowable

composite resin (EsthetX Flow, Dentsply Caulk). The original piece was then precisely positioned, and it was photo polymerized for 35 s (figures 9).

**Case 2:** To prevent the tooth from dehydrating and becoming dislodged following obturation, it was secured in the mouth. The same process as in Case 1 was used in the treatment plan. (figures 10



Figure 10 Post space preparation performed photograph



Figure 11 Dual cure luting system and a glass fiber reinforced



Figure 12 Postoperative radiograph



Figure 13 Postoperative Image

### 3. Discussion:

The reattachment of tooth pieces is a treatment that is no longer a temporary restoration due to the development of adhesive methods and resin composites. Only when a whole tooth fragment is available can this procedure be applied. In the current case series, a conservative approach was used, and the broken pieces were reattached using posts for retention. Excellent retention and ongoing stability of the restored part are provided by the post.

One in four people under the age of 20 will experience a traumatic anterior crown fracture, according to studies. If there is a fracture fragment still present, reattachment should be the primary course of action. The restoration of function while maintaining good and long-lasting aesthetics is made possible by the use of the natural tooth substance. It is undoubtedly a straightforward process and has a positive psychological effect. Restoration with cast metal posts may result in coronal wedging stresses that could lead to a previously weaker root breaking, which could result in irreparable failure. Root fracture in posts made of fiber-reinforced composite resin has been found to be minimal.<sup>8</sup>

According to studies, cemented custom cast posts and cores offer significantly more resistance to failure than dentin-bonded resin post-core restorations. The undercuts and surface imperfections of the fiber-reinforced posts are employed to improve the surface area for bonding, which reduces the risk of tooth breakage during function or traumatic injury<sup>9</sup>.

### 4. Conclusion:

Only when the fragment is there and may be enhanced with various adhesive procedures and restorative materials is the possibility of reattaching the tooth

fragment high. The key priority is educating the populace to avoid eating the broken piece and to seek out emergency dental care.

### References:

- [1] Eder D, Parker S. The cultural production and reproduction of gender: The effect of extracurricular activities on peer-group culture. *Sociol. Educ.*. 1987 Jul 1:200-213.
- [2] Andreasen JO, Andreasen FM, Mejàre I, Cvek M. Healing of 400 intra-alveolar root fractures. 1. Effect of pre-injury and injury factors such as sex, age, stage of root development, fracture type, location of fracture and severity of dislocation. *Dent Traumatol.* 2004 Aug;20(4):192-202.
- [3] Wilson CF. Management of trauma to primary and developing teeth. *Dent. Clin. N. Am.* 1995 Jan 1;39(1):133-167.
- [4] Macedo GV, Ritter AV. Essentials of rebonding tooth fragments for the best functional and esthetic outcomes. *Pediatr Dent.* 2009 Mar 1;31(2).
- [5] Macedo GV, Diaz PI, DE O. FERNANDES CA, Ritter AV. Reattachment of anterior teeth fragments: a conservative approach. *J Esthet Restor Dent.* 2008 Feb;20(1):5-18.
- [6] Moule AJ, Kahler B. Diagnosis and management of teeth with vertical root fractures. *Aust. Dent.* 1999 Jun;44(2):75-87.
- [7] Worthington RB, Murchison DF, Vandewalle KS. Incisal edge reattachment: The effect of preparation utilization and design. *Quintessence*

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Int. 1999 Sep 1;30(9).

Dent: 2012 Jan;15(1):80.

[9] Giudice GL, Lipari F, Lizio A, Cervino G, Cicciù M. Tooth fragment reattachment technique on a pluri traumatized tooth. J Conserv

[10] Saha SG, Saha MK. Management of a fractured tooth by fragment reattachment--a casereport. Int. J. Clin. Dent. 2010 Apr 1;2(2):43-48.