

## Case Report:

# Reattachment of anterior teeth fragments: A conservative approach

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### Abstract:

Coronal fractures of the anterior teeth are one of the common form of dental trauma that mainly affects children and adolescents. One of the options for managing coronal tooth fractures when the fractured tooth fragment is available and there is minimal amount of violation of the biological width is the reattachment of the dental fragment. Reattachment of the fractured tooth fragments can reestablish good and long-lasting esthetics (because the tooth's original anatomic form, color, and surface texture are maintained). It also restores function, establishes a positive psychological response, and is a relatively simple procedure. Patient cooperation and knowledge of the limitations of the treatment is of prime importance for good prognosis. This article depicts a coronal tooth fracture case that was treated with success using tooth fragment reattachment.

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### Introduction:

Dental trauma often results in a severe impact on the social and psychological well being of a patient. Crown fractures of permanent incisors account for 18-22% of all trauma to dental hard tissues, 28-44% being simple (enamel +dentin) and 11-15%,complex (enamel +dentin +pulp). Of these 96% involve maxillary central incisors[1].

Traumatized anterior teeth require immediate functional and esthetic repair. Conventionally such injuries have been restored with composite resins. They have the prime disadvantage of colour mismatch and uneven wear. Therefore if a broken

fragment is available, the restoration of the tooth utilizing its own fragment has been suggested as an alternative [2] The advantage of reattachment of fractured fragments achieves immediate esthetics, more reliable outline form, possibility of maintaining the occlusal function, absence of uneven wear . Cost effectiveness and excellent time resource management[3].

### Case report

A 23-year-old male patient reported to the Department with the chief complaint of broken Upper front tooth following trauma one day ago which occurred during to a motorcycle accident (Figure 1).



Figure 1: Pre-operative clinical view

Clinical examination revealed horizontal fracture at the junction of middle and cervical third region of the right and left maxillary incisors involving enamel and dentin with exposure of the pulp and the fractured fragments was loosely attached to the tooth. The fracture was not apparent palatally. Soft tissue

examination presented laceration of the upper lip . A periapical radiographic examination revealed oblique fractures labiopalatally; the root formation was complete without any extrusion of the tooth (Figure 2).



Figure 2: Pre-operative IOPA

The patient expressed the desire to maintain the tooth and restore it, as it was economical & esthetic in comparison to an indirect restoration. A detailed explanation about the treatment plan was explained to the patient, which included endodontic treatment, and then reattachment of the tooth crown using a fiber

post and informed consent was taken from the patient. Local anesthesia was administered followed by the removal of the fractured segment completely and was preserved in physiological saline solution so as to prevent dehydration and discoloration of the tooth fragment (Figures 3 and 4).



Figure 3: Clinical view after fragment separation.

Figure 4: Fragments placed in normal saline

Following a thorough examination, the fit of the fragment was checked. Working length was determined with the help of radiograph followed by the biomechanical preparation by step back technique, with the master file being 45 k-file. Irrigants such as 2.5% sodium hypochlorite and saline solution were used during the preparation alternately. The root canal was dried with paper points and obturated by using lateral condensation technique with gutta percha (Dentply Maillefer, Ballaigues, Switzerland) and AH Plus sealer (Maillefer, Dentply, Konstanz, Germany).

After the endodontic treatment was complete, the root canal was prepared for the post placement by removing the gutta percha from the coronal two-thirds of the canal with the help of peeso reamers (drill size 2). Bevels were placed on the tooth and the fractured fragment, in order to enhance the retention. The fibre post (Dentply Tulsa, Johnson city, US) was tried in the root canal and was adjusted to the desired length (Figure 5). Space was also prepared in the pulp chamber of the fractured crown fragments for receiving the crown portion of the post and also the core.



Figure 5: Post placed in root canal



Figure 6: Post space prepared in broken fragments

The alignment of the coronal fragment was established with the post in situ. The canal was then etched with 37% ortho phosphoric acid, rinsed, and blot dried with paper points, and bonding agent was applied. The post was then luted in the canal with the use of dual cured resin luting cement (Ivoclar

Vivadent). The inner portion of the crown fragment was etched and bonded to the tooth in a similar way using flowable composite resin (Ivoclar Vivadent) after proper shade matching. The tooth was polished with polishing disc (Figure 7).



Figure 7: Post-Operative clinical view

Occlusion was checked and postoperative instructions were given to the patient in order to prevent any loading of the anterior teeth. Clinical and radiographic examinations were carried out after 1 month, 3 months, and 6 months and a favourable tooth response was obtained.

#### **Discussion**

Dental trauma is such a situation in which the patient is affected both socially and psychologically. Various methods and techniques were employed to restore fractured teeth including pin retained resin, orthodontic bands, stainless steel crowns, porcelain jacket crowns, and complex ceramic restorations [4,5] However all these restorations require significant tooth preparation and

are not esthetically adequate; moreover they cannot be used in an emergency esthetic situation [6,7].

The first case report on reattachment of a fractured incisor fragment was published by Chosack and Eidelman in 1964 wherein the complicated tooth fracture was managed by endodontic therapy followed by a cast post and core [8]. The utilisation of acid etch technique for the reattachment of fractured fragment was first reported by Tennery [9]. Similar cases were also reported by Starkey [10] and Simonsen [11]. The success of reattachment relies on certain factors such as the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of the root formation, biological width invasion, occlusion, time material used for reattachment, use of post, and prognosis

[12]. Reattachment is a way to restore the natural shape, contour, translucency, surface texture, occlusal alignment, and color of the fragment with a positive emotional and social response from the patient to the preservation of natural tooth structure, and it is also an economical and a conservative procedure [13-18]

In recent years following remarkable advancements of adhesive systems and resin composites, it is now possible to achieve excellent results with reattachment of tooth fragments provided that the biological factors, materials, and techniques are logically assessed and managed [19]. As with the conventional restoration, success of restoration depends on proper case selection, strict adherence to sound principles of periodontal and endodontic therapies, and the techniques and materials for modern adhesive dentistry [20-22] In the present case of complicated crown fracture requiring endodontic therapy, the fractured fragment

was available and reattachment of the fragment with fiber post was performed. The use of the natural tooth substance offer conservative, esthetic, and economical option that provides good and long lasting esthetics, restores function, results in a positive psychological response, and is certainly a simple procedure. Adhesive post is used as it provides the potential for increased retention, is more flexible, and has modulus of elasticity approximately same as dentin, and when bonded with resin cement it distributes forces evenly along the root[23].

### **Conclusion**

With the present day materials available , along with an appropriate technique , esthetic results can be achieved with predictable outcomes.

Thus , the reattachment of a tooth fragment is a viable technique that restores function and esthetics with a very conservative approach , and it should be considered when treating patients with coronal fractures of the anterior teeth

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