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## Reattachment of fractured anterior tooth using Ribbond and an esthetic post-A case report

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### Abstract

Coronal fractures of permanent dentition are the most frequent type of dental injury. If the original tooth fragment is retained following fracture, the natural tooth structures can be reattached using adhesive protocols. The immediate fragment reattachment is a very conservative treatment. It allows the restoration of the original dental anatomy thus rehabilitating function and aesthetics in a short time by preserving dental tissues. This paper presents the clinical sequence of reattaching the fractured fragment of maxillary lateral incisor (22) with esthetic post and ribbond, resulting in immediate natural esthetics by using the original tooth fragment.

**Keywords:** Reattachment, Fiber post, Ribbond Fibers

### 1. Introduction

Traumatic crown fractures, which are caused from dental injuries, are a serious dental public Health problem<sup>[1]</sup>. A majority of the crown fractures involve the maxillary incisors<sup>[2]</sup>. The reattachment of the fractured tooth fragment has advantages including the preservation of the remaining tooth structure, reproducibility of the tooth contour and natural colors, and the most well-preserved incisal transparency<sup>[3]</sup>.

Resin based restorative materials are frequently used in restoration of the fractured teeth. Because of the poor mechanical resistance of these materials, different approaches developed to strengthening resistance of composite resin, such as fiber posts<sup>[4]</sup>.

Fiber reinforced composite (FRC) materials when used, as posts are more advantageous than the conventional post systems<sup>[5]</sup>. This paper presents a case report wherein the fractured fragment of left maxillary lateral incisor was reattached using esthetic post and ribbond fibers.

### 2. Case report

A 15 years old female patient reported to the department of Pedodontics, Sri Aurobindo College of dentistry, Indore, with the history of fall and injury to the upper front teeth one day back. Extra-oral examination revealed no significant abnormalities, and intra-oral examination revealed neither lacerations nor evidence of alveolar bone fracture, but there was a fracture line extended from labiopalatally in apical direction in relation to 22 which was supragingival [Figure 1a and 1b]. Based on clinical and radiographic findings, it was diagnosed as Ellis class III fracture in relation to 22. It was planned to perform single visit root canal treatment (RCT) on 22 followed by reattachment of the fractured fragment with fiber post and Ribbond fibers reinforcement. Local anesthesia was administered (1.0 cc of lidocaine 2% with 1: 80,000 epinephrine) and the fractured segment in relation to 22 was atraumatically removed. It was then cleaned with 2% chlorhexidine solution and stored in isotonic saline solution. RCT was completed on 22. Immediate sectional obturation was done using gutta perch and AH plus sealer. (Dentsply Maillefer, Dentsply) and post space was prepared using GG drills and Peeso reamers. Meanwhile the fragment was cleaned of pulp tissue (Figure 2a). Both the intact coronal portion of the tooth and the original crown fragment were etched with 37% phosphoric acid gel for 20sec, rinsed with water for 20 sec and dried with a gentle stream of air, dentin bonding agent (Adper Single Bond Plus, 3M)

Flowable composite resin (Filtek Supreme XT, 3M) was applied and cured for 40sec. Fragment was positioned to its original place with the help of fiber post (D.T. Light Post Illusion #2, Bisco, Schaumburg, IL, USA) and a strip of Ribbond fiber (Ribbond Inc., Seattle, WA, USA). Excess resin was removed and light cured for 40 seconds. (Figure 2b)

Clinical and radiographical follow-up examination, at 6 months was evaluated: fragment position, fragment stability, gingival swelling, and presence of abscess, sinus tract formation, sensitivity to percussion were normal and satisfactory. (Figure 3a,3b)



**Fig 1a and 1b:** Clinical presentation of labiopalatal fracture of maxillary left central incisor



**Fig 2a and 2b:** Fractured fragment cleaned of pulp debris and placement of fiber post with ribbond fiber into the prepared post space



**Fig 3a and 3b:** Six months follow up: clinical and radiographic image

### 3. Discussion

A fractured anterior tooth requires immediate clinical attention and, if untreated, can cause damage to dentition and even have a psychological impact on the patient [6].

As esthetics is of utmost importance to the patient, the dentist should therefore value the importance of adequately restoring the esthetic elements of the tooth. The restoration of root canal treated teeth, with significant loss of tooth structure, is often achieved with post and core. However, post may generate stresses which lead to vertical root fracture and loss of the tooth. Glass fiber posts were introduced in 1900, which offers several advantages such as esthetic, have modulus of elasticity similar to that of dentin, and reinforcement of restored segments by the formation of monobloc [7].

Several conditions must be taken into consideration to determine the ideal option, such as the location and extent of the fracture, the pulpal condition, the degree of tooth

eruption, the degree of root formation and the patient's esthetic demand.

Ribbond is a FRC, which is made up of polyethylene fibers. It is a spectrum of 215 fibers with a very high molecular weight. These fibers have a very high coefficient of elasticity (117 Gpa), so it has an excellent resistance to stretch and distortion. They also have a very high resistance to traction (3 Gpa), as a result of their closed stitch configuration and a good adaptability. Bondable reinforcement fibers are also characterized by impact strength five times higher than that of iron. They are translucent and assume the color of the resin to which they are added [8].

The combined use of a glass fibre reinforced with Ribbond fibers as root canal post and reattachment of an original crown fragment is a simple and efficient procedure for the treatment of traumatized anterior teeth that appears to offer excellent aesthetic and functional results.

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