

# Fragment Reattachment For Complicated Crown Root Fracture – A Case Report

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## Abstract:

Complicated crown-root fractures are challenging dental injuries that involve both enamel and dentin structures and extend into the root. They often necessitate a multifaceted approach to achieve successful reattachment and functional restoration. This case report describes the management and outcomes of a complicated crown-root fracture using a reattachment technique.

**Keyword:** Complicated crown root fracture; Reattachment; Fibre reinforced post; Resin cement

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## I. Introduction

Dental trauma, encompassing injuries to the teeth and surrounding oral structures, ranges from enamel chips to complete fracture of tooth and attachment apparatus and represents a significant challenge in everyday clinical practice. Effective management of dental trauma is crucial not only for preserving tooth function and aesthetics but also for ensuring long-term oral health and patient well-being.

The prevalence of dental trauma is notably high among children and adolescents, often resulting from sports injuries, accidents, or falls.<sup>1</sup> While managing a traumatized tooth, factors such as extent of fracture, amount of remaining tooth structure, pulpal involvement, associated fracture of alveolar bone or soft tissue injury, stage of tooth development, availability of fracture segment, and restoration of esthetics must be considered.<sup>2,3,4</sup>

A crown-root fracture typically occurs when a fracture line extends through the crown of the tooth and into or near the root structure and involves enamel, dentin and cementum. It can be complicated or uncomplicated depending on the presence of pulp involvement. The complexity of these fractures often demands a multidisciplinary approach to achieve optimal outcomes.

The initial assessment is by clinical and radiographic examination and immediate treatment often involves stabilizing the injured tooth, managing pain, and deciding whether endodontic therapy, restorative work, or a combination of treatments is needed.<sup>5</sup> When the fractured segment is available and intact, reattachment of the fragment with adhesive technique is a more conservative treatment approach. In case of complicated crown root fracture, it involves root canal treatment followed by reinforcement of segments with fibre post. It provides better esthetics as the natural translucency, colour and contour of the tooth is maintained.<sup>4,6</sup>

## II. Case Report

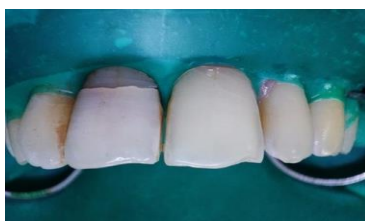
A 48 years old male patient reported with a complaint of fractured upper front tooth due to skid and fall from bike. On clinical and radiographic examination, a complicated crown root fracture, with a mobile fracture segment and an incomplete oblique fracture line extending subgingivally in the palatal aspect was found on maxillary right central incisor (tooth no: 11) (Fig 1a). The fragment was held in position by the soft tissue palatally. The periapical and periodontal regions were intact in the radiograph (Fig 1b). There was minor abrasions on chin, and the patient had no relevant medical history. Various treatment options were explained to the patient and the patient wanted to retain the tooth and was not willing for the removal of fracture segment. Hence, it was planned to do endodontic treatment followed by fibre post for reattaching the fracture segment without removing it, provided that hemostasis could be achieved.

After obtaining patient consent local anaesthetic was administered and the fracture segment was re-approximated and splinted with ligature wire and composite, under rubber dam isolation (fig. 2). Single visit

endodontic treatment was then performed as there was no bleeding after root canal preparation. Sectional obturation was done, and the post space was refined with peeso reamer size 2 at slow speed, taking care not to disturb the fracture segment. A size 2 fibre reinforced post (Reforpost, Angelus, Brazil) was checked radiographically in the post space. After confirming the fit the post space was conditioned and adhesive was applied. The post was treated with silane coupling agent (Ultradent, South Jordan, Utah) and bonded with dual cure resin cement (3M ESPE, Relyx U200, Minnesota, US) by injecting and agitating it in the post space to flow into the fracture lines. The resin cement was then light cured. The labial fracture line was restored with composite. Occlusion was checked, and there was no centric or eccentric contacts (fig. 3a,3b). The patient was further recalled after 2 weeks, 3, 6, 12 and 18 months and was asymptomatic with a satisfactory clinical and radiographic outcome (fig 4a,4b). Patient was satisfied with the results and was not interested to go for a jacket crown.



**Fig. 1a- Pre operative clinical view**  
**Fig. 1b- Pre operative radiographic view**



**Fig. 2- Rubber dam isolation**



**Fig. 3a- Post operative clinical view**  
**Fig. 3b- Post operative radiograph**



**Fig. 4a- radiograph after 6 months**  
**Fig. 4b- radiograph after 18 months**

### III. Discussion

Trauma to the anterior teeth with the underlying esthetic, psychosocial, functional and therapeutic problems adversely affect an individuals quality of life. Quality and timeliness of initial care contribute to a desirable outcome by promoting healing. Trauma of the oral and maxillofacial region comprises 5% of all body injuries. In oral injuries, dental injuries are most common (92%). Dental trauma in most common in 7 to 12 years old age group and falls and accidents are mostly contributing to dental trauma. The site mostly involved is the maxillary anterior region.<sup>7,8</sup>

A crown root fracture is the one that involves enamel, dentin and cementum and usually requires a multidisciplinary approach as it often involve the biological width. Crown root fracture may be complicated or uncomplicated depending on the pulpal involvement, and it is usually a chisel type fracture.<sup>2,9</sup>

Management of crown root fracture is challenging due to the difficulty in achieving proper isolation which is essential for the hermetic seal of the restoration.

Various treatment modalities have been employed for the post endodontic restotation of complicated crown root fracture such as removal of the coronal segment and orthodontic extrusion, surgical extrusion or gingivectomy with or without osteotomy to make the subgingival fracture line supragingival. Intentional replantation with extraoral repair of the fracture can also be considered as a treatment option. Orthodontic extrusion takes a prolonged treatment time. In surgical repositioning the periodontal fibres are severed and may fail to reattach leading to complications such as tooth mobility, external resorption or replacement resorption (9).

Many case reports and researches in the literature suggest that reattachment of a fractured tooth fragment is a viable approach when the fractured segment is available.<sup>10,11</sup> In the present case reattachment was considered as the treatment option as it needs minimal intervention and lesser time.

While performing reattachment of tooth fragments, different strategies can be employed to improve the bond strength and esthetics, such as placement of circumferential bevel, external chamfer, V- shaped enamel notch or internal groove.<sup>(12)</sup> In the present case bevel was placed for this pupose. Reis et al. demonstrated that placement of bevel and rebuilding with composite resin provided high fracture strength.<sup>12</sup>

Use of fiber post in reattachment has several advantages. It act as a splint to reinforce the fracture segment, has better adhesion to the root dentin, is more esthetic, aid in stress distribution and requires less chairside time.<sup>13</sup> Dual cure resin cement used for the adhesive cementation of fibre post is characterized with good flow properties and higher degree of polymerization even inside the root canal where the light cannot reach.

Reattachment procedure offer several advantages over conventional composite restoration. Original shape, color, surface texture and translucency of enamel is maintained. Furthermore, this technique can be less time-consuming and provide more predictable long-term appearance with the newer adhesive materials available today, in conjunction with appropriate techniques.<sup>12</sup>

### IV. Conclusion

Management of traumatic injury involves restoration of structure, function and esthetics. It requires theoretical as well as practical knowledge of newer treatment modalities and its indications. Accurate case selection and strict adherence to clinical protocol is mandatory for long term success of a particular treatment. Tooth fragment reattachment is a comparatively safe and fast procedure that requires only minimal intervention.

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