



**CROWN DILACERATION AND ROOT RESORPTION OF A
PERMANENT MANDIBULAR CENTRAL INCISOR FOLLOING
INJURY TO PREDECESSOR**

Kumar A^{1*}, Rana M², Hooda A³, Dutta S¹, Goel M⁴, Dahiya A⁵, Kumar V⁶

¹Department of Pedodontics & Preventive Dentistry, ³Oral Anatomy, ⁴Oral Surgery, ⁵Orthodontics,
Post Graduate Institute of Dental Sciences Rohtak-124001, Haryana, India.

²Department of Periodontology, Manav Rachna Dental College and Hospital, Faridabad, Haryana, India.

⁶ Department of Oral and Maxillofacial Surgery, Post Graduate Institute of Medical Education and Research, Chandigarh,
India.

Corresponding Author:- **Arun Kumar**

E-mail: drarun922@gmail.com

<p>Article Info <i>Received 15/04/2015</i> <i>Revised 27/05/2015</i> <i>Accepted 02/06/2015</i></p> <p>Key words: Dilaceration, Root resorption, FRC-Ribbon.</p>	<p>ABSTRACT Dilaceration of permanent successors is one of the most common complications of trauma to their predecessors teeth, especially in children and adolescents. Root dilaceration is more common than dilaceration of crown which constitutes only 3% of the traumatic dental injuries to developing teeth. Presented here is a rare case report of severe crown dilaceration with associated root resorption of mandibular central incisor in a 9 year old boy following injury to its predecessors tooth treated by placing extracted natural crown with Fibre Reinforced Composite-Ribbon as an alternative to conventional space maintainer.</p>
--	--

INTRODUCTION

Traumatic dental injuries appear to be an emerging public health problem particularly among children and adolescents. Moreover, injury to deciduous teeth with prevalence ranges from 9.4% to 41.6 % [1]. The observed post traumatic permanent tooth malformation includes enamel discoloration, enamel hypoplasia, crown or root dilacerations, odontoma like malformation, tooth germ sequestration, partial or total interruption of root formation, and eruption disorders [1].

Crown dilaceration of a permanent tooth which constitutes 3% of the total injuries to the developing tooth bud is a rare developmental disorder and less frequently in mandibular anterior teeth. Suggested treatment options include extraction of affected permanent tooth followed by replacement of a single tooth by adhesive splint using a natural tooth pontic, denture tooth, or composite resin tooth pontic embedded in reinforced composite fiber, wire, and metal or nylon mesh [2].The case report documented a case

of an esthetic and biologic solution to a severe and rare crown dilaceration of a lower permanent central incisor as a result of traumatic intrusion of predecessor presented along with root resorption using reinforced polyethylene fibre (FRC-RIBBOND).

Case report

A nine year old boy reported with the chief complaint of unesthetic appearance and mobility of lower right front tooth since 3 month. Past dental history revealed a history of fall at home, 6 ½ years back resulted in inward displacement of lower right front teeth. The patient did not receive emergency dental treatment at that time; and extraction was delayed because of the parental concerns, performed a week ago.

Intraoral examination revealed angulation with respect to crown portion of lower right permanent central incisor in labial direction suggestive of dilaceration (Figure


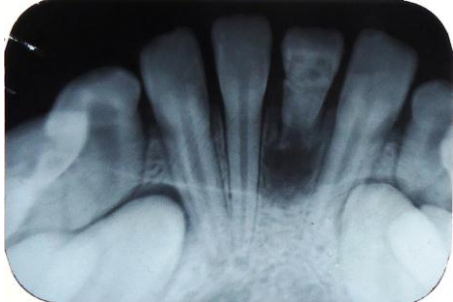


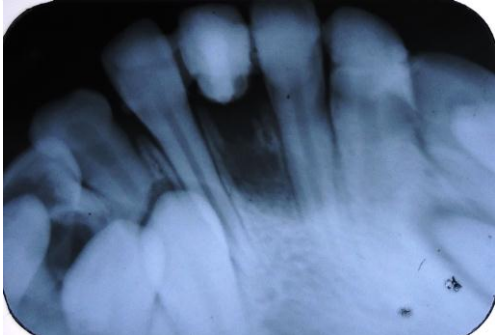



1). Further, gingival third of the labial surface showed caries due to plaque deposition as the surface is not accessible for oral hygiene aids. Radiographic examination showed root resorption and periapical radiolucency with respect to same tooth (Figure 2). Tooth neither responds to vitality testing (heat and cold).

Considering the parent's concern about esthetics and age of the patient, extraction of the dilacerated incisor was planned followed by fabrication of a fiber reinforced composite (FRC-RIBBOND) space maintainer using the same tooth.

The tooth was extraction and placed in saline. On observation, crown appears to be severely dilacerated. Moreover, buccal surface was short with respect to crown length as compared to lingual surface resulted from crown angulation (Figure 3). The root of the extracted tooth was resected using a straight fissure bur at the cemento-enamel junction. Cervical caries were removed and buccal surface was restored of normal anatomic contour with light cure composite. Pulpal remnants were extirpated, the pulp

chamber was irrigated with saline, and access was sealed with composite resin. A horizontal groove was made in the middle third of the crown lingually at nearly 2 mm depth to accommodate the thickness and width of Ribbond. The adequate length of the Ribbond fiber was measured using a dental floss. Lingual surface of extracted and adjacent teeth were etched with 37% phosphoric acid for 30 seconds, and then thoroughly cleaned and dried. The fiber soaked in bonding agent was adapted onto the lingual surface of extracted tooth to ensure adequate fits into the groove and light cured from multiple directions for 20 seconds (Figure 4). Ribbond fiber adapted extracted crown was then positioned in its space and adapted to the adjacent teeth. After confirming the correct position, the remaining fiber was coated with composite and light cured. Finally, occlusion was checked; finishing and polishing was performed. Radiograph was taken to confirm the position of tooth (Figure 5). The patient was motivated to maintain good oral hygiene and regular follow up. One year follow up revealed satisfactory esthetic results (Figure 6).

<p>Figure 1. Pre-operative view showing dilacerated crown of right mandibular central incisor.</p> 	<p>Figure 2. Pre-operative IOPA showing root resorption with respect to dilacerated crown.</p> 
<p>Figure 3. Dilacerated tooth after extraction.</p> 	<p>Figure 4. Final prepared crown with attached Ribbond fiber.</p> 
<p>Figure 5. Immediate post-operative IOPA view.</p> 	<p>Figure 6. Post-operative view (1 year follow up).</p> 

DISCUSSION AND CONCLUSION

Crown dilaceration are usually due to intrusive luxation or avulsion of their primary predecessors [1]. Chadwick [3], Dua & Patil [4] have reported cases of dilaceration in mandibular incisors, but without such complication making present case a rare entity. The pathology of crown dilaceration can be explained by the theory of displacement of the enamel epithelium and mineralized portion of tooth in relation to the dental papilla and cervical loop [5].

Ligh [6] stated that the clinical appearance of permanent incisors with dilaceration of crown depends on the stage at which the injury to the developing tooth bud occurred. Diab and Elbadrawy [7] stated that as the formation of the crown is usually complete by 3 years, crown dilacerations were clinically and radiographically observed in children who suffered trauma upto 2 years. In the present case report, intrusive luxation injury of 81 at age of 2 ½ years could have been the reason for the severe crown dilaceration of 41. Further, defective enamel and dentinal tubules structure of dilacerated crown portion of tooth act as a nidus for bacterial entry into the pulp space, thereby leading to pulp necrosis and arrest of root development.

Current case presented severe dilaceration of crown portion of lower mandibular central incisor with associated mobility resulted from root resorption indicating a poor prognosis, so extraction remained the treatment of choice. Further, due to esthetic consideration in children early replacement of missing tooth is warranted.

Biologic restoration provides several advantages such as desirable esthetics, optimum pontic shape, size and

alignment. Besides, it provided better gingival health, greater patient–parent satisfaction and tolerance to the effects of tooth loss. In the present case, caries over the labio- gingival surface was removed, restored with light cure composite resin that would provide a better color match for the crown, which was originally discolored due to inaccessibility to clean, resulted from severe dilaceration. Further, a biologic crown is known to eliminate the problem of differential wear of restorative materials, unmatched shades, difficulty of contouring, and texture reproduction associated with other restorative techniques [8], hence, it was considered as a good treatment option in the present case.

Ribbon was selected in this case, as it is an ultrahigh molecular weight polyethylene fiber having virtually no memory; hence, it adapts to the contours of the teeth and dental arch. It is translucent, practically colorless and disappears within the composite or acrylic without show through offering excellent esthetics. Key factors that influence the physical properties of fiber reinforced structures are fiber loading within the restoration and efficacy of the bond at the fiber resin interface, fiber orientation and fiber position in the restoration [9]. Care should be taken to prevent exposing the moist Ribbon (with unfilled resin) to light as it would lead to initial polymerization, which would interfere with its manipulation and bond strength [10].

This is an interesting case report as it presents the rare effect of trauma to primary tooth resulting in crown dilaceration of permanent tooth and uses of natural tooth pontic to manage the same with 1 year follow up.

REFERENCES

1. Assuncao LRS, Ferelle A, Iwakura ML, Cunha RF. (2009). Effects on permanent teeth after luxation injuries to the primary predecessors: a study in children assisted at an emergency services. *Dent Traumatol*, 25, 165-170.
2. Tayab T, Vizhi K, Srinivasan I. (2011). Space maintainer using fiber-reinforced composite and natural tooth -a non-invasive technique. *Dental Traumatol*, 27, 159-162.
3. Chadwick SM, Millet D. (1996). Dilaceration of a permanent mandibular incisor. *British Journal of Orthodontics*, 22, 279-281.
4. Dua A, Patil AC. (2010). Crown dilaceration of a permanent mandibular central incisor-a case report. *Hong Kong Dent*, 7, 36-40.
5. Andreasen JO, Flores M. (2007). Textbook and color atlas of traumatic injuries to the teeth. Oxford (UK): Blackwell Munksgaard, 542-576.
6. Ligh RQ. (1981). Coronal dilaceration. *Oral Surg Oral Med Oral Pathol*, 51, 567.
7. Diab M, Elbadrawy HE (2000). Intrusion injuries of primary incisors. Part III: Effects on the permanent teeth successors. *Quintessence Int*, 31, 377-384.
8. Chu FCS, Yim TM, Wei S. (2000). Clinical considerations for reattachment of tooth fragments. *Quintessence Int*, 31, 385-391.
9. Ganesh M, Tandon S. (2006). Versatility of Ribbon in contemporary dental practice trends biomater. *Artif Organs*, 20, 53-58.
10. Eminkahyagil N, Erkut S. (2006). An innovative approach to chairside provisional replacement of an extracted anterior tooth: use of fibre – reinforced ribbon-composites and a natural tooth. *J Prosthodont*, 15, 316-320.

