

Management of horizontal fracture of central incisor - A reattachment case report with one year follow up

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Abstract

Crown fractures are the most common consequences of traumatic injuries that mainly occur in the anterior permanent dentition. Most of the traumatic injuries to the anterior teeth result in fracture of the crown. Upper crown fracture might disturb the esthetics and phonetics, this might have an impact on the overall psychosocial appearance of the patient.¹ Hence this case report discusses the management by horizontal crown fracture by reattaching the broken fragment.

Keywords: crown en masse, fracture, reattachment.

Introduction

Dental trauma is a frequent occurrence in permanent dentition and can occur at any age, with increased numbers documented in the first and second decades of life. When considering the spectrum of injuries, crown fractures with or without pulp exposure are the most

common type, varying from 26.2% to 44.1% of all dental injuries.² It is estimated that a quarter of the population suffers a minimum of one dental traumatic injury related to coronal fractures of the anterior teeth before the age of 18 years, the most common of which are attributed to falls, high impact sports, and motor vehicle accidents.³

For crown fractures, there are relatively easy and well-documented treatment possibilities that vary based on the involvement of pulp. In uncomplicated crown fractures, if the fragment is saved, the simple adhesive reattachment of the fragment is the method of choice. If the fragment is lost or unsuitable for reattachment, then direct resin composite restoration is preferred.⁴ This article below discusses such crown fracture reattachment using fiber post.

Case Report

A 28-year-old male patient reported to the Department of Conservative-Dentistry and Endodontics with the chief complaint of a broken upper front tooth following trauma 2 days ago. Initial clinical examination revealed a horizontal crown fracture in the cervical third of the right central incisor involving the pulp. Mobility of the fractured segment evident. Radiographic examination revealed an oblique fracture labio-palatally. After routine history taking and examination, a treatment plan was formulated to immediately reattach the dental fragment of the tooth using prefabricated fiber post and core and detailed explanation regarding the treatment was given to the patient.

Procedure involves administration of Local anesthesia for pulp extirpation and root canal treatment. The fracture segment was preserved in physiological saline solution in order to prevent dehydration of the tooth fragment. A clean horizontal fracture, mesial to distal angulated incisal Ly from labial to palatal was. No caries or resorption defects were detected. Access cavity was prepared and Working length was determined at 17mm. Standardized conventional technique of BMP was done and copious amounts of 3%NaOCl was used as an irrigant along with saline as a final irrigant throughout the cleaning and shaping procedure. The canal walls are completely dried using absorbent paper points. Sectional obturation was done using 40- 6% using zinc oxide eugenol sealer. Following sectional obturation, post space was prepared till size 3 peso reamer and the canal was irrigated simultaneously while preparing the post space with 3% sodium hypochlorite and final rinse EDTA for 1 min followed by saline. Fiber post of size 3 was cemented using rely x U200 (3M ESPE), following the coronal fragment cementation , dentine groove was prepared in the coronal fragment for better retention of

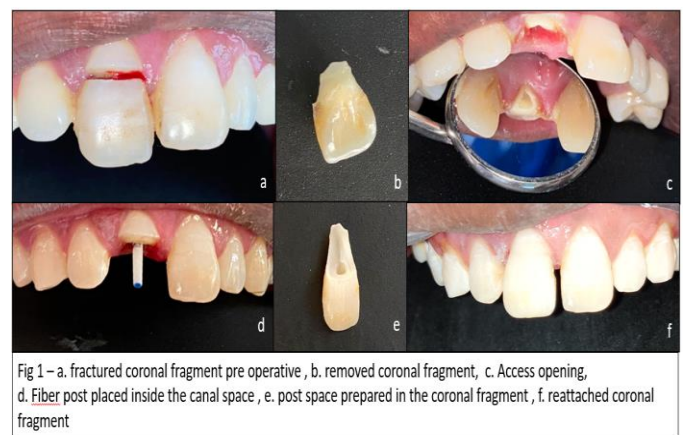
the fractured fragment and the pulp chamber was loaded with flowable composite and seated on the cemented post, maintaining alignment with finger pressure until the composite set. A postoperative radiograph was taken to confirm apposition of the two tooth portions. Patient was recalled after 2 days for the post-operative review. one year follow up revealed no signs of inflammation and healing was evident without compromising the function and esthetics.

Follow-Up

Clinical and radiological follow-up was performed after 1, 3, 6, 12 months. During the follow-up period, the patient was fully asymptomatic, there were no signs of apical radiolucency. The clinical crowns of central incisors did not present any sign of discoloration and the probing depth was within physiological limits, with no clinical attachment loss. The patient and his parents were informed about the ideal follow-up regime, consisting of clinical and radiological evaluation yearly at least for another 3 years

Discussion

Anterior teeth are more susceptible to trauma, approximately 80% of maxillary incisors followed by maxillary lateral incisors and central mandibular incisors.⁵



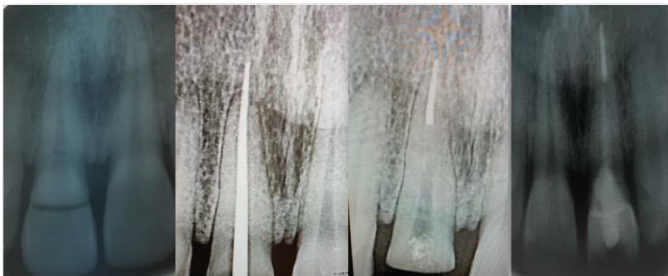


Fig 2: Preoperative radiograph , Mastercone radiograph , Sectional obturation radiograph , Postoperative (fiber post placed with fractured fragment reattached)



Fig 3: Preoperative and Post operative image



1 YEAR FOLLOW UP

The tooth reattachment technique is considered to be conservative time effective and Esthetic approach; however, with the advancement in adhesive dentistry, the practice of fragment reattachment has become easier and more reliable. Though tooth fragment bonding provides a number of distinct advantages, the main advantage is aesthetics where the tooth natural form, shape, and colour is maintained.⁴

Chosack and Eidelman first described in 1964, restoration of fractured teeth using the dental fragment offers a fine way to reinstate the natural shape, contour, surface texture, occlusal alignment, and colour of the fragment.⁶ Various case reports and literature suggest

that reattachment of a fractured tooth fragment is a viable approach for the treatment of coronal fracture of anterior teeth when the fractured segment is available.

Recent developments in restorative materials, techniques, preparation designs, and adhesive protocols have allowed clinicians to predictably restore fractured teeth. With the advent of adhesive dentistry, the process of fragment reattachment has become simplified and more reliable, it has also allowed dentists to use the patient's own fragment to restore the fractured tooth.^{4,5,6}

Some authors suggested that the additional preparation of the tooth (dentin grooves, over-contouring technique, chamfering, bevelling, etc.), prior to reattachment or otherwise, can provide higher fracture resistance compared with simple bonding.⁷ However, Cha zine et al and Bruschi et al reported that the choice of materials did not influence the treatment outcome. However, there is no literature about the ideal technique for reattaching a fractured tooth fragment.

Other important aspects of the tooth fragment reattachment techniques are the choice of the reinforcement methods used. Reinforcement of the reattached fragments using posts has been widely reported in the literature. Although many techniques with various materials have been suggested, resin-based restorative materials with tooth-colored fiber post may be considered the best option because of several advantages such as a suitable elastic modulus, esthetics, good bonding between post and cement, lower chair time, and minimal tissue removal.⁸ It is also reported that the use of a fiber post with fractured teeth, as it interlocks the two fragments, minimizes the stress on the reattached tooth fragment.

Conclusion

Reattachment of the tooth fragment with fiber post can be considered to be a better approach if the intact

fragment was available. This method provided favourable outcome during the one year follow up. Hence can also be considered as a long-term treatment option while treating a horizontal crown fracture.

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