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An Immediate temporary management of reattachment of central incisor - A Case Report

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Abstract

Coronal fractures of the front teeth are common sequelae of dental trauma. In case of complex fractures, where the fractured segments are available and there is close approximation of the segment to the remaining tooth, root canal treatment followed by reattachment of the fractured segment with post reinforcement is a better option. This case report documents the management of the dental trauma using a distinctive method of reattaching the fractured fragment using stainless steel k-file instead of fiber post. The procedure is simple and economic and needs less chair-side time as compared to many conventional methods. This procedure provides good and long-lasting esthetics, because the original morphology, colour, surface texture are maintained.

Keywords: crown en masse, fracture, reattachment.

Introduction

The most common type of facial injuries is traumatic dental injury accounting for as high as 18%of all facial injuries. Fracture of maxillary anterior teeth occurs frequently in young individuals .[1] Restoration of a fractured tooth is a better option compared to extraction of teeth. Crown fractures are one of the most common consequences of traumatic injuries. It is estimated that a quarter of the population suffers a minimum of one dental traumatic injury related to coronal fracture of the front teeth before the age of 18 years, the most common of which are attributed to falls, high-impact sports, and motor vehicle accidents.[2] The prevalence of lesions associated with sports and violence increases with age. Depending on the trauma intensity, the tooth may be chipped off, partially or completely dislocated, or even knocked out of the oral cavity. Tooth fractures require

prompt treatment for restoring their function and cosmetic. Patients with increased overjet or lip incompetence are much more likely to suffer traumatic injuries in the upper incisors.[3] Ellis Class VIII involves the loss of crown (en-masse) .If the fracture of the crown occurs below the gingival attachment there will be violation of biological width, resulting in chronic pain inflammation of the gingival and unpredictable loss of alveolar bone.[4] However in some cases where fracture does not extend beyond the gingival margin can be managed by endodontic treatment followed by reattachment of the fractured fragment with rigid post intents to maintain the esthetics and natural tooth form . The intent of this article is to report a case of maxillary central incisors with fracture of crown en masse and its rehabilitation by different approach.

Case Report

A 55-year-old Male reported to the dental school with the chief complaint of a broken upper front tooth while playing and wants to restore it immediately. Detailed history revealed that the patient broke his maxillary right central incisor while playing tennis; the racket had hit his front tooth resulting in fracture. On clinical examination it is revealed that complete crown fracture of maxillary right central incisor where one end of the fracture was slightly attached sub gingivally with mild bleeding around the gingiva. The cervical region has been restored previously with GIC. Patient requested immediate management of the fractured teeth since he doesn't want an unesthetic appearance. Hence an immediate temporary treatment plan of reattachment of fracture fragments done. Instead of using a rigid metallic post a rigid 80 size stainless K file was used to anchor the coronal fragment to the root. Firstly, the fractured fragment was repositioned in its place. Due to lateral luxation of the maxillary right central incisor mild proximal reduction was done on the mesial aspect for repositioning the fracture fragment to the root portion. After repositioning both the fragments, Bonding agent (Opti Bond All-In-One) was applied on both fragments, cured for 20 second and the tooth was luted using flowable composite (3M Filtek Z350 flowable restorative composite). For endodontic treatment access was gained through the coronal portion of the tooth. Pulp extirpation done. Working length determined at 23mm. Standardized conventional technique of BMP was done upto 80 size K file till the working length of 23mm. Copious amount 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. ZOE sealer was coated around the walls and around 80 size K file and the file was inserted into the canal till working length and the k file was sheared off near the canal orifice leaving the file inside the canal. This file acts as a rigid post holding both the fragments together. The canal orifice has been sealed using a temporary restorative material until further permanent restoration has been done.

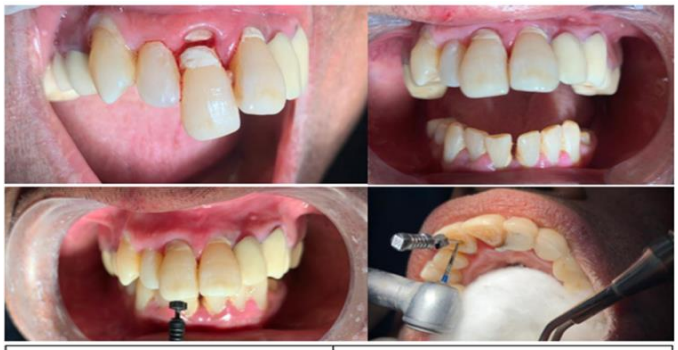

fig 1a: preop (Ellis class VIII Fractured central incisor)	fig 1b: post operative – reattachment of the crown
fig 1c: Fractured fragment re attached using 80size K file	fig 1d: 80size K file sheared off near the coronal orifice

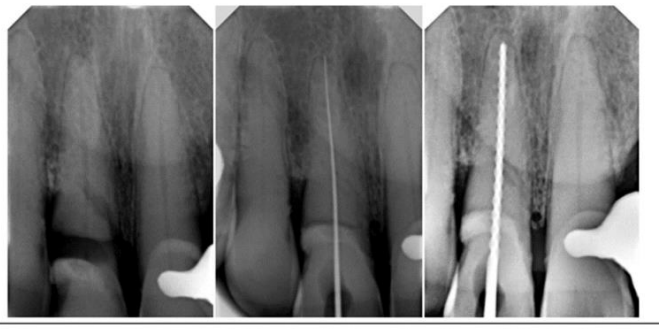

fig 2a: pre-op radiograph, fig 2b: Working length radiograph fig 2c: fragment stabilized and reattached using 80 size k file

Discussion

Dental injuries usually cause severe problems that affect patients from the point of pain, function, aesthetics and psychology.[5] several factors influence the management of crown root fractures, including the extent of fracture (biological width violation, endodontic involvement, alveolar bone fracture). The pattern of fracture and restorability of fractured tooth and also the presence/absence of the fractured tooth fragment. Its condition of use (fit between fragment and the remaining tooth structure), esthetics, finances, and prognosis.[6] A number of treatment options have been proposed for crown-root fractures, each has their own merits and demerits. Whenever the fracture fragments were available, reattachment should be the first choice of treatment. Reattaching the fragments to a great extent restores aesthetics, as it uses the original tooth's shape, color, translucence and surface structure.[7] Reattachment of tooth fragments of anterior teeth is an easy to practice and economic method that has the potential to assume incisal strength during tooth functioning. The method ensures increased wearing steadiness and thus creating better function. Other advantages of this method are the psychological comfort of the patient, less time spent in the dental chair, exact reconstruction of tooth's morphology and usage of structure that wears out as the antagonists.[8] Occlusal forces, generated at protrusive movements of the mandible are extremely destructive to the relation tooth fragment – bonding agent.[9] Furthermore, composites are the most frequently used material for reattachment of fractured fragments as they provide higher bond strength between the reattached. Post-core are usually indicated in teeth with severe crown destruction.

The purposes of restoration are; support, replacement and retention. Retention problems may occur at teeth with severe crown destruction and root-canal treatment.[10] In the present case, considering time, cost, and patient's immediate demand of restoration of aesthetics, reattachment of crowned fragment was planned using stainless steel k file which was used instead of prefabricated rigid posts. Stainless steel k file were used since they are rigid enough to act as an intracanal retainer and anchor the separated fragments.

Rigid posts are indicated for teeth with less than 3 to 4 mm of vertical height or when less than 25% of the tooth structure remains. However, teeth with minimal tooth structure above the gingiva for a ferrule need additional cervical stiffness for a more rigid post to resist distortion from the force. In the absence of the cervical tooth structure, excessive flexibility can result in micro movement of the core and coronal leakage.[11] non-rigid posts such as flexible posts are beneficial for teeth with 25 -50% of remaining tooth structure. In this particular case of crown root fracture, no ferrule could be achieved, because of very less coronal tooth structure, making a rigid post the material of choice.[10,11] This method was an immediate temporary method to reattach the fragment as losing the front teeth might have a greater impact on the patient's psychology and social appearance. However the permanent treatment plan of prefabricated metal or custom cast post followed by permanent coronal seal with composite restoration is indicated. For the ease of removal of the stainless-steel file during the definitive

treatment, the coronal portion of the file core was restored using temporary restorative material, so that further permanent core can be built over the prefabricated or custom cast post.

Conclusion

It can be concluded that fragment tooth reattachment as an alternative treatment for fractured anterior teeth is simple, conservative, cost effective, aesthetically pleasing and acceptable with a fair survival rate. However, longer-term follow-up is recommended in future.

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