

Single visit reattachment of an Ellis class III fracture of maxillary central incisor

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Abstract

Fracture of maxillary central incisors is the most common dental injury seen in today's hectic life due to increased road accidents, contact sports or other accidents. It not only causes pain but affects the patient's esthetics to a large extent. This always is the first concern of the reporting patient. Reattachment of the fractured fragment is possible when patient seeks immediate dental treatment along with the fractured fragment. The following case report describes the treatment of fractured right central incisor using fractured fragment along with prefabricated post. The fragment was attached using composite. This re-established the functions and esthetics of the patient in single visit. During follow up appointment, clinical and radiographic examination revealed no complications. This suggests the efficiency of single visit endodontic treatment and importance of retaining fractured fragment of the tooth.

Keywords: Anterior crown fracture, Reattachment, Post, Composite

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Introduction

Any trauma to the oral structure has a great brunt on the teeth, mostly because of the forward positioning and the nature of trauma. The teeth, being hard tissue in nature aren't as resilient and tend to fracture on trauma. Commonly, injury to permanent teeth occur secondary to falls, traffic accidents, violence, and sports injuries.¹ The anterior teeth, due to their great esthetic value, demand a faster and natural restoration. In this period of advances in adhesive technology, various techniques and materials are available to the dentist in order to provide patient with good esthetic and functional results. A multidisciplinary approach helps in achieving the aforementioned goals. Fragment reattachment is the most conservative option which re-establishes functional as well as esthetic harmony. The most natural restoration could be nothing but the fragmented tooth itself, provided it gives a complete seal over the remaining tooth structure. The aim of such a treatment should be relief from pain and an acceptable aesthetic result for the patient.

Case Report

A 29 year old female patient, reported to the department of Conservative Dentistry and Endodontics at M. R. Ambedkar dental college and hospital, with a fractured anterior tooth and pain as the chief complaint. Patient had a history of fall a day before. There was complicated crown fracture in relation to the right

maxillary central incisor. There was no soft tissue injury or swelling. Tooth was tender on percussion. On examination, the coronal fragments were still attached palatally by fragile soft tissue (Fig. 1). Since esthetics was a major concern for the patient, reattachment of the fractured fragment was planned. Under local anesthesia, the fragment was removed with forceps without damaging the soft or the hard tissues (Fig. 2). Complete pulp tissue was removed and fragment (Fig. 3, 4) was stored in saline. Working length was determined and cleaning and shaping was done by crown down technique, followed by obturation of the canals using lateral condensation technique. The sealer used was AH plus, for better sealability² and to eliminate any chances of discoloration³. Gingival contouring on palatal side was done to expose the palatal margin using electrocautery. The fracture line was horizontal and at the cervical third, it extended below the level of gingiva palatally. Guttapercha from the canal was removed, leaving apical 5 mm using a peeso reamer. Prefabricated metal screw post was selected and cemented into the canal using Glass Ionomer Cement (Fuji II, GC) (Fig. 4). Using a no. 4 round bur, retention box was prepared in the fragment to accommodate the head of the post (Fig. 5).



Fig. 1: Pre-operative photograph



Fig. 2: Extracted coronal fragment with extension beyond CEJ



Fig. 3: Intraoral post extraction of the fragment



Fig. 4: Cementation of a screw post after root canal treatment



Fig. 5: Ditch made into the crown to adjust the post head

For subgingival isolation, a 25% aluminum sulfate hemostatic gel (Tissue Goo, Clinical Research Dental) was used to impregnate and lubricate a knitted cord (UltraPak, Ultradent). Using an atraumatic cord placement technique, the cord was placed in the sulcus. The reason for using a hemostatic gel was to attain a better control on bleeding into the sulcus and the partially disrupted biological width area.

Both the fragments and teeth were etched using 37% phosphoric acid for 30 seconds and rinsed. Bonding agent was applied using an applicator tip and distributed evenly using a mild air blast from a three way syringe. Fragments were reattached using resin cement. Curing below the cemento-enamel junction was aided by the retraction achieved. After final curing, excess was removed by polishing (Fig. 6, 7). Contact was relieved in all the protrusive and lateral movement. Teeth were kept in protected occlusion. Post-operative instructions were given. Patient was recalled after one week for review.



Fig. 6: Intraoral palatal view post cementation of the fragment



Fig. 7: Intraoral labial view post cementation of the fragment

Discussion

Various classification systems have been proposed for anterior teeth fracture such as Andreasen and Andreasen's classification; Spinaz and Altana's classification. In the above mentioned case, the fracture was complicated crown fracture i.e. fracture of the crown involving the pulp⁴. Endodontic therapy not only provides pain relief and eliminates any further chances of infection because of a necrotic pulp, but, also provides space for post placement. For the purpose of reattachment various materials such as composite, dual cure resin, light cured GIC, etc. can be used⁵. Treatment decisions differ from case to case depending on the patient's desires and viability of the treatment options. Tooth reattachment technique produces good esthetic and functional result. Moreover, patient's self-esteem remains positive due to maintained natural tooth appearance and esthetic. Important factors for tooth reattachment are as follows, the degree of the fragment adaptation to the remaining structure; fragment retention; fracture location; and pattern. The quality of fit between the radicular and the reattached segments is clinically an important factor for the longevity of the reattached crown. Use of prefabricated post provides retention as well as the distribution of forces along the root to the apical area. According to the amount of the restoration, screw posts or cast posts could be used for supporting the fragment⁶. Cavalier et al., reported that reattachment of the crown fragment appeared to have a better long term prognosis than composite resin restoration⁷. During the procedure, the fragment must be stored in sterile saline or distilled water or coconut water to avoid dehydration⁸. The dehydrated fragment is lighter than the remaining fracture remnant. Return of the natural color may need time or may never occur.⁹

Conclusion

Dental trauma can have better outcomes if the people in general are better aware of the first-aid measures and the need to seek immediate treatment. Fragment reattachment is a conservative and economical approach in crown fracture cases compared

to other options such as ceramic crowns and composite build up. In addition, this approach provides one of the best aesthetic results as well.

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