Reattachment of Crown Fragment for Immediate Esthetics

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Introduction

Fall, fight, and vehicle accidents are the common causes of dentoalveolar trauma, resulting in fracture of anterior teeth. These fractures subsequently lead to esthetic, functional and phonetic problems. Restoration approach depends on the type of fracture, type of occlusion and the prognosis [1]. Esthetics is an important requirement in determining the treatment strategy of a crown root fracture. Different treatment modalities for this kind of problem range from the maintenance and use of the original tooth fragment, definitive crown after an orthodontic and surgical extrusion or a crown lengthening, extraction followed by implant or fixed partial denture, composite restorations and post core supported restorations [2].

However, now it has become possible to use the fractured segment of the tooth either as a temporary or permanent crown. This technique can be applied to the fractures which include simple enamel-dentine portions and to the more complex situations in which the pulp and periodontium are involved [3]. We report the use of this technique in the management of a complicated fractured maxillary lateral incisor.

Case Report

A 38 year old female patient reported to Command Military Dental Centre (NC) with a complaint of a fractured right maxillary lateral incisor because of trauma sustained during fall (Fig.1). The crown fragment was brought by the patient. She did not have swelling or hemorrhage in the related area and medical history was non-contributory. Pulpal exposure was seen (Fig.2). The patient, a school teacher was immensely concerned about immediate restoration of esthetics. Hence, we decided to restore esthetics immediately by reattaching the original crown fragment after ruling out periodontal damage, root fracture and bony fracture. To prevent dehydration the original fragment was kept in distilled water till the completion of root canal treatment and post preparation.

After completing the endodontic treatment (Fig. 3) a screw

post was inserted into the root canal for retention (Fig. 4). A hole was drilled in the middle part of the crown fragment. After etching the adherent surface of the fragment and root surface, primer was applied and the crown fragment was reattached to the root surface with composite adhesive. The restoration was light cured, finished, polished and checked for proper contact (Fig.5). Tooth was allowed to have protected occlusion by removing a thin enamel layer from the palatal side at the contact point. The entire treatment procedure was completed in one sitting.

Discussion

Complicated crown fracture is a fracture involving enamel, dentin with exposure of the pulp [4]. The treatment is similar to that of uncomplicated crown fracture except that complicated crown fracture requires the treatment of the pulp, pulp capping, pulpotomy, or pulpectomy. The traditional conservative treatment of crown fractures has been restorations with composite resin and a dental bonding system.

Adhesive systems can now be used to treat tooth fractures by reattachment of the tissue fragment to provide restoration. Factors influencing the extent and feasibility of such repairs include the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of root formation, biological width invasion, occlusion and time and resources of the operator and patient. The fractured fragment needs to be preserved in sterile saline or water to prevent color change due to dehydration. Dehydrated fractured fragment might get rehydrated over several months [5]. Mobile but still in place fractured fragment needs to be splinted with adjacent teeth if delay is expected in completing endodontic treatment due to possible damage to the periodontium. According to the amount of the restoration, screw posts, cast posts or dentin pins could be used for supporting the fragment [6]. The use of posts increases retention and distributes stress along the root. Matrix for repositioning segments can be of great

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Fig. 1 : Pretreatment

Fig. 2 : Exposure of pulp

Fig. 5 : Post treatment

Fig. 3 : Post root canal treatment Fig. 4 : Placement of post

advantage where fragment alignment is problematic [7]. Tooth preparation technique would be relative to the site and amount of tooth fragment for reattachment [8].

Survival rates of such restorations are good with failure resulting from subsequent trauma [9]. Cavaller et al [10] reported that reattachment of the crown fragment appeared to have a better long-term prognosis than composite resin restoration. The results indicated that reattachment of fractured incisal fragments by using new generation bonding agents was effective against shear stresses and comparable with the intact teeth. The advantages of using the original tooth fragment over other materials include better color match, morphology, translucency, physiochemical characteristics, patient acceptance and economical [7]. Other treatment options available have associated limitations like multiple visits, stabilization and are less conservative in nature. In the long term the tooth may develop a periapical lesion or get discolored. Apicoectomy and PFM restoration will have to be adopted should the need arise. Our case was followed up for one year without noticeable color change of the crown or periapical radiological changes. The patient continued with the reattached fragment as a permanent restoration.

Preparation of ceramic/porcelain fused to metal (PFM) restoration requires additional visits, tooth

preparation and laboratory procedures. Hence we recommend that the original reattached fragment be allowed to continue as permanent restoration unless tooth exhibits color changes or there is subsequent trauma. Re-attachment technique provides immediate esthetics and functional rehabilitation but follow-up must include assessment of occlusion, periodontal health and subsequent traumatic force reduction. The reattachment of the crown fragment to a fractured tooth can be considered as a most conservative treatment and could be first choice for crown fractures of anterior teeth.

Conflicts of Interest

None identified

References

1. Villat C, Machtou P, Naulin-Ifi C. Multidisciplinary approach to the immediate esthetic repair and long-term treatment of an oblique crown-root fracture. *Dent Traumatol* 2004; 20:56-60.
2. Meiers JC, Freilich MA. Chairside prefabricated fiber-reinforced resin composite fixed partial dentures. *Quintessence Int* 2001; 32:99-104.
3. Baratieri LN, Montiro S, De Andrada MAC. Tooth fracture reattachment: case reports. *Quintessence Int* 1990; 21:261-70.
4. Toshihiro K, Rintaro T. Rehydration of crown fragment one year after reattachment: A case report. *Dental Traumatology* 2005; 21: 297-300.
5. Simonsen RJ. Restoration of the fractured central incisor using original tooth fragment. *J Am Dent Assoc* 1982; 105:646-8.
6. Attila Oz I, Cenk Haytac M, Toroglu MS. Multidisciplinary approach to the rehabilitation of a crown-root fracture with original fragment for immediate esthetics: a case report with 4-year follow-up. *Dental Traumatology* 2006; 22, 48-52.
7. Wadhvani CPK. A single visit, multidisciplinary approach to the management of traumatic tooth crown fracture. *Br Dent J* 2000; 188:593-8.
8. Murchinson D, Burke F, Worthington R. Incisal edge reattachment: indications for use and clinical technique. *Br Dent J* 1999; 186:614-9.
9. Andreasen F, Rindum JL, Munksgaard E, Andreasen JO. Bonding of Enamel- Dentine Crown fractures with GLUMA and resin. *Endod Dent Traumatol* 1986; 2:227-80.
10. Cavalleri G, German N. Traumatic crown fractures in permanent incisors with immature roots: a follow-up study. *Endod Dent Traumatol* 1995; 11:294-6.