

Immediate reattachment of fractured tooth segment: A biological approach

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ABSTRACT

Trauma to the permanent teeth is rather common event among school children. A trauma accompanying with fracture of anterior teeth is a tragic experience for the young patient who requires immediate attention, not only because of damage to the dentition but also because of psychological effect of the trauma to the child and his parents. A number of techniques have been developed to restore the fractured crown. With the materials available today, in conjunction with an appropriate technique, esthetic results can be achieved with predictable outcomes. One of the options for managing coronal tooth fractures when the tooth fragment is available and there is no or minimal violation of the biological width is the reattachment of the dental fragment. Reattachment of fractured tooth fragments can provide good and long-lasting esthetics. This report describes a case of fragment reattachment in a 10 year old male patient following trauma to maxillary central incisor with 6 and 12 months follow-up.

Introduction

The maxillary central incisors are the teeth most susceptible to fractures caused by direct trauma such as contact sports, road accidents and falls. Aesthetic rehabilitation of crown fractures of the maxillary anterior teeth is one of the greatest challenges to the dentist. The present generation is very conscious about their appearance and demand for immediate treatment and aesthetic rehabilitation. The conventional approach for rehabilitation of fractured anterior teeth include composite restoration, post supported prosthetic restoration and in some cases extraction and fixed prosthetics.[1] There is however no synthetic restorative material that can replicate the esthetic characteristics or color stability of the natural tooth structure. Therefore esthetic and minimally invasive restorative alternative for the fractured tooth is the reattachment of natural tooth fragment.

The first published case of reattaching a fractured incisor fragment was reported in 1964 by Chosack A et al [2] Anterior tooth fragment have been reattached using composite [3], interlocking pins [4] and light cured resins.[5]

Reattached fragment to a great extent restores esthetics, as it uses the original tooth's shape, color, translucence and surface structure.[6] Reattachment of tooth fragment of anterior teeth is easy to practice and economic method that has the potential to assume the incisal strength during tooth functioning. The method ensures increased wearing steadiness and thus creates better function. [7] This report describes a case of fragment reattachment in a 10 year old male patient following trauma to maxillary central incisor and 12 months follow-up of the same.

Case Report

A 10 year old male patient reported to our department following trauma to maxillary central incisor. Trauma had occurred 30 minutes earlier while playing in the ground. Patient's mother had brought the fractured segment with her. Patient's medical history was non contributory. Examination revealed that the teeth had horizontal fracture involving enamel and dentin (Figure 1). Fractured portion of the tooth were intact (Figure 2). The tooth tested positive to the electric pulp tester. No mobility of the injured tooth was recorded and surrounding tissues were healthy. A periapical radiograph showed that the root formation was complete with no extrusion (Figure 3). The tooth fragment was immediately maintained in normal saline during whole period prior to restoration. Following a detailed examination, the adaptation of the fragment was checked. It was decided to reattach the tooth fragment. After isolation of the fractured tooth, acid etching of both the remaining tooth surface and the fragment was carried out for 15 seconds using 37% phosphoric acid (Scotchbond, Etchant Phosphoric Acid from 3M ESPE) then rinsed thoroughly with water and air dried. Next the primer and adhesive (Scotchbond, 3M ESPE, St. Paul, MN, USA) was applied on the etched surfaces and were not light cured. Then the resin cement (Esthet XD, Denstply) was manipulated according to the manufacturer's instruction and applied to the fragment and tooth surface.

Later the restored surface was finished and polished (Sof-Lex™ disks 3M ESPE, St. Paul, MN, USA). The repaired area was barely visible, and the esthetic result was excellent (Figure 4). Occlusion was checked and post operative instructions to the patient were given to deter from loading the anterior teeth. The patient was

recalled after 6 and 12 months postoperatively (Figure 5,6). The tooth tested positive to the electric pulp tester. No mobility of the injured tooth was recorded and surrounding tissues were healthy.

Discussion

Coronal fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents. The majority of dental injuries involves the anterior teeth, especially the maxillary incisors (because of its position in the arch), whereas the mandibular central incisors and the maxillary lateral incisors are less frequently involved. Dental injuries usually affect only a single tooth; however, certain trauma types such as automobile accidents and sports injuries involve multiple tooth injuries.[8] The psychological trauma caused to the individual due loss of aesthetics can be managed by this procedure successfully. When a tooth has not

sustained a luxation injury, this technique should be considered [9] Kanca J reported a reattachment procedure with the fragment being intact at 5 year follow-up visit; however their case had a pulpal exposure at the time of trauma which was sealed with a dentine adhesive.[10]

Whenever the fractured fragment is available intact, the reattachment of the fragment has to be the most desired treatment. In recent years due to remarkable advancement of adhesive systems and resin composites has made reattachment procedure no longer a provisional restoration.

Fabrication of a mouth guard and patient education about treatment limitations may enhance clinical success as reattachment failures may occur with new trauma or parafunctional habits. [11] The professional has to keep in mind that a dry and clean working field and the proper use of bonding protocol and materials is the key for achieving success in adhesive dentistry.



Fig 1: Preoperative intra-oral view



Fig 2: Fractured tooth segment

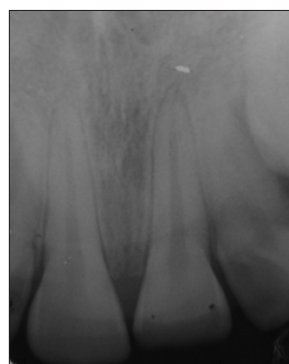


Fig 3: Preoperative radiograph of the fractured tooth



Fig 4: Postoperative view after reattachment of the fractured tooth



Fig 5: Postoperative radiographic view after 6 months of reattachment



Fig 6: Postoperative radiographic view after 12 months of reattachment.

Conclusion

The technique described in this case report is reasonably simple, while restoring function and esthetics with a very conservative approach. Reattachment of the intact fractured segment can be considered as an ultraconservative method for aesthetic rehabilitation. Recent development of the adhesive materials has made the treatment of fractured tooth easier and more esthetic. Now traumatic injuries can be dealt with, in an adhesive way, but the only need is to educate people to preserve the fractured fragments.

References

1. Attila IO, Cenk MHA, Serdar MT. Multidisciplinary approach to the rehabilitation of a crown -root fracture for immediate esthetics. *Dent Traumatol* 2006;22:48-52.
2. Chosack A, Eidelman E. Rehabilitation of a fractured incisor using the patient's natural crown-case report. *J dent child* 1964;71:19-21.
3. Reis A, Kraul A, Francci C et al. Reattachment of fractured teeth: a review of literature regarding techniques and materials. *Oper Dent* 2004;29:295-300.
4. Kalra N, Rai P. Biological aspects of tooth fragment reattachment in immature incisors. *J Indian Soc Pedo Prev Dent* 2005;23:42-3.
5. Spasser HF. Repair and restoration of a fractured, pulpally involved anterior tooth: report of a case. *J Am Dent Assoc* 1977;94:519-20.
6. Arapostathis K, Arhakis A, Kalfas S. A modified technique on the reattachment of permanent tooth fragments following dental trauma. Case report. *J Clin Pediatr Dent* 2005;30(1):29-34.
7. Cavalleri G, Zerman N. Traumatic crown fractures in permanent incisors with immature roots: a follow-up study *Endod Dent Traumatol* 1995;11:294-96.
8. Andreasen JO, Andreasen F, Andersson L. Textbook and color atlas of traumatic injuries to the teeth. 3rd ed. St Louis (MO):Mosby;1994.
9. Giorgio R, Claudia M, Angelo P. Clinical procedures for the immediate reattachment of a tooth fragment. *Dent Traumatol* 2002;18:281-4.
10. Kanca J. Replacement of a fractured incisor fragment over pulpal exposure: A long-term case report. *Quintessence International* 1996;27:829-32.
11. Andreasen FM, Noren JG, Andreasen JO et al. Long term survival of fragment bonding in the treatment of fractured crowns. *Quintessence Int* 1995;26:669-81.

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