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Reattachment of Fractured Anterior Tooth: A Case Report

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Abstract: *Coronal tooth fracture, especially in maxillary anterior teeth are mostly common in children and adolescents but can occur in any age group. Trauma to maxillary anterior teeth affects the patient both socially and psychologically, so the immediate treatment of such patients is must. If the fractured tooth fragment is available (clean and hydrated) then the reattachment of such fragment is the best treatment option available, as such treatment will result in original anatomic form, color and surface texture. Reattachment of complex tooth fracture requires reinforcement by fiber post and adhesive system. This article discusses a case report regarding successful reattachment of fractured tooth fragment.*

Keywords: *Crown Fracture; Fragment Reattachment; Adhesive Technology*

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I. Introduction

In young patients, dental trauma is a more common event in permanent dentition and results in fracture of anterior teeth. These fractures subsequently lead to various problems like esthetic, function, and phonetics. Management of the dental trauma requires accurate diagnosis and treatment plan.[1] Various factors influence the treatment approach for a complicated crown fracture like, the level and position of tooth fracture line, availability of displaced tooth fragments, type of occlusion, and prognosis.[2,3] A number of techniques have been developed to restore the fractured anterior teeth such as the use of the tooth fragment either as a temporary or permanent crown, definitive crown after an orthodontic and surgical extrusion or a crown lengthening, extraction followed by implant or fixed partial denture, composite restoration and post and core supported restoration.[4] If the intact tooth fragment is available, reattachment of tooth fragments can be considered and this technique is a viable alternative to conventional approach with minimal or without violation of biologic width.[5,6] Reattachment of fragment offers various advantages like, better aesthetics and achievement of life-like translucency, incisal edge wears at a rate similar to that of the adjacent teeth, replacement of fractured portion involving less time, positive emotional and social response from the patient and relatively inexpensive procedure.[7]

Reattachment of tooth fractured at the cervical level can be reinforced with the use of post as it interlocks the two fragments and minimizes the stresses on the reattached tooth fragment.[8] With the recent improvements in resin based restorative materials, tooth colored fiber posts along with resin luting cement are of choice because of several advantages such as esthetics, bonding to tooth structure and low modulus of elasticity similar to that of dentin.[9] The purpose of this article is to present a case report regarding the successful management of a complex tooth fracture by reattachment of fractured tooth fragment using adhesive technology.

II. Case Report

A 29 year old female patient reported to the Department of Conservative Dentistry and Endodontics, Bhojia Dental College, Budh.Baddi (H.P) having fractured anterior teeth and pain as chief complaint. Patient had a history of fall 1 day before. There was complicated crown fracture of left maxillary lateral incisor. There was no soft tissue injury or swelling. Tooth was tender.

On clinical examination an Ellis class III fracture was noticed with respect to the maxillary left lateral incisor. **(Figure1)** An oblique supra-gingival fracture line was visible both labially and palatally. Fractured fragment was loosely attached to the tooth. There was no injury to the adjacent hard and soft tissue. On radiographic examination it was found that there was no associated root fracture and the periapical tissue was healthy. **(Figure 2)** As the fractured segment was available, the treatment plan decided was-reattachment of the fractured segment. The treatment procedure was explained to the patient and she agreed to it.

After administering local anesthesia, the fractured part was carefully removed and to prevent dehydration and discoloration, the original fragment was kept in distilled water till the completion of root canal treatment and post space preparation (Figure 3). Isolation was achieved using rubber dam and saliva ejector placed in position. Access opening was done and working length was determined with the help of apex locator (SmarPex, Meta Biomed) and later confirmed by radiograph. A glide path was prepared till no. 15 K files (Dentsply Maillefer, Switzerland). The biomechanical preparation was done with Protaper (Dentsply Maillefer, Switzerland) rotary file system. The last file used in the canal was F3. 2.5% sodium hypochloride and normal saline were used as irrigants. After the completion of biomechanical preparation, root canal was dried with the help of paper points (Dentsply Maillefer, Switzerland). The obturation was done with the help of F3 (Dentsply Maillefer, Switzerland) gutta-percha point using AH plus (Dentsply Maillefer, Switzerland) sealer following cold lateral compaction technique. **(Figure 4)**Bevels were placed on the tooth and the fractured fragment, in order to enhance

the retention.**[Figure 3]** The coronal fragment and fractured tooth were etched with 37% Orthophosphoric acid separately, and then rinsed, dried and 5th generation bonding agent (Ivoclar Vivadent) was applied and light curing was done according to the manufacturer's instruction. Further, coronal fragment was bonded to the tooth using flowable light cure composite resin (Ivoclar Vivadent) [Figure 4] after proper shade matching. The tooth was finished and polished with finishing instruments and polishing discs (Ivoclar Vivadent). Occlusion was checked and postoperative instructions were given to the patient. The patient and his parents were instructed to avoid heavy occlusal loading on the fractured site. Clinical and radiographic examinations carried out after 1 year showed positive response. Inner portion of the coronal fragment was etched and bonded to the tooth using flowable composite resin (EsthetX Flow, Dentsply) after proper shade matching and is cured. After curing, postoperative IOPA was done to check the proper placement of fiber post and fractured crown segment (Figure 6). The fracture line labially was then masked using composite resin (EsthetX, Dentsply) (Figure 7). The composite was then polished with polishing disks (Sof-lex, 3M/ESPE). Follow up examinations were carried out after one week, three month, one year and two years, the tooth was functional and asymptomatic.

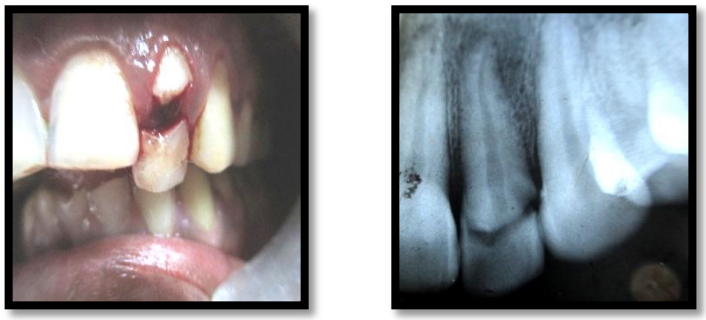

Figure 1: Preoperative View (Clinically & Radiographically)

Figure2: Working Length Determination

Figure 3,4: Master Cone And Post Obturation Iopa

Figure 5: After Composite Build Up

III. Discussion

For fractured crown, various classification systems are given such as Andreasen and Andreasen's classification; Spinas and Altana's classification. In the above mentioned case, the fracture was complicated crown fractures i.e. fracture of the crown involving pulp.[10] Endodontic therapy provides pain relief and space for post placement. Various materials such as composite, dual cure resin, light cured GIC, can be used for reattachment purpose.[11] Treatment decisions have to be made case by case for the individual patient. Tooth reattachment technique produces good esthetic and functional result. Moreover patient's self esteem remains positive due to maintaining natural tooth appearance. Important factors for tooth reattachment are: the degree of the fragment's adaptation to the remaining structure; fragment retention; fracture location; and pattern. The quality of fit between the segments is clinically important factor for the longevity of the reattached crown. Cavaller[12] et al reported that reattachment of the crown fragment appeared to have a better long term prognosis than composite resin restoration.[13]During the procedure the fragment must be stored in sterile saline or distilled water to avoid dehydration.[14] A lasting dehydration of tooth's fragment can cause disturbance of the esthetics as the longer dehydration of the fragment is, the greater probability for not matching the original tooth's color will be. In most cases dehydrated fragment is lighter than the remained after the fracture remnant. Return of the natural color may need time or may never occur.[13] Assessment of occlusion after reattachment is essential as occlusal forces, generated at protrusive movements of the mandible are extremely destructive to the relation tooth fragment – bonding agent.[15] The possible afterwards complications include discoloration of the attached fragment and fractured reattached teeth show a high degree of failure to labial horizontal forces with new trauma. Regular follow-up is necessary.

Follow-up visits are critically important for all traumatic injuries. The patient should be followed for 3, 6, 12 months and yearly for 5 years.[9] Esthetics, tooth mobility, and periodontal status should be confirmed both clinically and radio-graphically on these follow-up visits. Fracture tooth reattachment allows restoration of the tooth with minimal damage to the remaining tooth structure. Various problems like differential wear of restorative material, unmatched shades and difficulty of contour and texture reproduction associated with other restorative techniques can be eliminated by the use of natural tooth structure.[16]

FIGURE LEGENDS
FIGURE 1: PREOPERATIVE VIEW (Clinically & Radiographically)
FIGURE2: WORKING LENGTH DETERMINATION
FIGURE 3: MASTER CONE IOPA
FIGURE 4: POST OBTURATION IOPA
FIGURE 5: AFTER COMPOSITE BUILD UP

References

[1]. Bruschi, *et al.* "Reattachment of anterior fractured teeth: Effect of materials and techniques on impact strength". *Dental Traumatology* 26.4 (2010): 315-322.

[2]. Aggarwal V., *et al.* "Complicated crown fractures-management and treatment options". *International Endodontic Journal* 42.8 (2009): 740-753.

[3]. Villat C., *et al.* "Multidisciplinary approach to the immediate esthetic repair and long-term treatment of an oblique crown-root fracture". *Dental Traumatology* 20.1 (2004): 56-60.

[4]. Meiers JC and Kazemi RB. "Chair side replacement of posterior teeth using a prefabricated fiber-reinforced resin composite framework technique: A case report". *Journal of Esthetic and Restorative Dentistry* 17.6 (2005): 335-342.

[5]. Murchison DF., *et al.* "Incisal edge reattachment: indications for use and clinical technique". *British Dental Journal* 186.12 (1999): 614-619.

[6]. Murchison DF and Worthington RB. "Incisal edge reattachment: literature review and treatment perspectives". *Compendium of Continuing Education in Dentistry* 19.7 (1998): 731-734.

[7]. Simonsen RJ. "Restoration of a fractured central incisor using original tooth fragment". *Journal of American Dental Association* 105.4 (1982): 646-648.

[8]. Anil Kumar S and Jyothi KN. "Reattachment of fractured tooth using self etching adhesive and esthetic fiber post". *Journal of Dental Science and Research* 1.2 (2010): 75-83.

[9]. Rajput A., *et al.* "Uncomplicated crown fracture, complicated crown-root fracture, and horizontal root fracture simultaneously treated in a patient during emergency visit: A case report". *Oral Surgery Oral Medicine Oral Pathology Oral Radiology Endodontics* 107.2 (2009): e48-e52.

[10]. Virginia K et al; Attachment technique with esthetics in mind: A trauma management case report; Journal of Massachusetts Dent. Soc. 2008 Winter;56(4):32-5.

[11]. Reis A, Loguercio AD, Kraul A, Matson E. Reattachment of fractured teeth: A review of literature regarding techniques and materials. Oper Dent. 2004;29(2):226-33

[12]. Cavalleri G, German N. Traumatic crown fractures in permanent incisors with immature roots: a follow-up study.Endod Dent Traumatol 1995; 11:294-6.

[13]. Baratieri LN, Ritter AV, Monteiro S Jr, et al. Tooth fragment reattachment: An alternative for restoration of fractured anterior teeth. Pract Periodontics Aesthet Dent 1998; 10: 115-125.

[14]. Pasini S, Bardellini E, Keller E, Conti G, Flocchini P, Majorana A. Surgical removal and immediate reattachment of coronal fragment embedded in lip. Dent Traumatol. 2006;22:165-8.

[15]. Dean JA, Avery DR, Swartz ML. Attachment of anterior tooth fragments. Pediatric Dent 1986; 19: 731-743.

[16]. Maia EA., *et al.* "Tooth fragment reattachment: Fundamentals of the technique and two case reports". *Quintessence International* 34.2 (2003): 99-107.

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