

Giving a Second Chance to Coronally Fragmented Tooth; a Case Report On Fragment Reattachment

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Abstract: Trauma to the anterior teeth is relatively a common occurrence. There are several treatment modalities for such condition, one of which is the reattachment of fractured fragment itself. Reattachment of fractured fragment provides immediate treatment with better esthetics, restoration of function, and is a faster and less complicated procedure. Reattachment of tooth fragment should be the first choice and is a viable alternative to conventional approaches because of simplicity, natural esthetics, and conservation of tooth structure. Patient cooperation and understanding of the limitations of the treatment is of utmost importance for good prognosis. This manuscript presents a case report describing the management of a cervically fractured maxillary anterior teeth in which the fragment was reattached and endodontically treated. Reattachment of fractured tooth fragment offers a viable restorative alternative, immediately restores tooth function and esthetics with the use of a very conservative and cost-effective approach.

Conclusion: Reattachment proved to be a successful technique in the present case report for restoring esthetics and function. However, because few long-term studies have been reported in the literature, the patient should be informed of possible interim nature of the treatment.

Key Word: crown fracture, endodontic treatment, fragment reattachment, trauma

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I. Introduction

Coronal fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents.¹ Dental injuries usually affect only a single tooth; however, certain trauma types such as automobile accidents and sports injuries involve multiple tooth injuries. The most common dental injuries involve the maxillary incisors.² When the tooth fragment is present and is in good condition, the best option for the treatment of a coronal fracture fragment is reattachment.³ This technique was first published in 1964, when Chosak and Eidelman described a case involving the reattachment of a natural tooth fragment.⁴

Several factors influence the management of coronal tooth fractures, including extent of fracture (biological width violation, endodontic involvement, alveolar bone fracture), pattern of fracture and restorability of fractured tooth (associated root fracture), secondary trauma injuries (soft tissue status), presence/absence of fractured tooth fragment and its condition for use (fit between fragment and the remaining tooth structure), occlusion, esthetics, finances, and prognosis.^{5,6} Coronal fractures must be approached in a systematic way to achieve a successful restoration.⁷

This article reports a case of coronal tooth fracture that was successfully managed by fragment reattachment.

II. Case Report

A 15-year-old male patient reported to the department of Conservative dentistry and endodontic of PSM College of Dental Sciences and Research with a chief complaint of fractured upper right front tooth following a blow on his face. On intra oral examination it was found that the fracture occurred on 12 at the cervical third (Ellis Class III fracture) with fractured segment separated labially and attached palatally (Fig 1.a). On radiographic evaluation it was found that a radiolucent line was present at the cervical third 3mm from the cemento-enamel junction. There was no subgingival extension of the fracture. Since the fractured segments were not separated it was decided not to manipulate the original architecture of the tooth and it was decided that we etch and bond the fragments together with composite (Fig1.b,c and d). Following which root canal treatment was initiated, access opening was done, working length was determined and cleaning and shaping was done (fig1.e and f). The root canal treatment was completed using lateral condensation technique and zinc oxide

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eugenol was used as sealer. A temporary restoration was given to seal off the access cavity. At the end of the first session the tooth fragments were stabilized with splints to the adjacent teeth (Fig 1.g).

In the subsequent visit, the splint was removed, post space preparation was done up to size 2 passo reamer leaving behind 5 mm GP at the apex. The canal was irrigated with saline to flush out the debris followed with the use of 17% EDTA to remove the smear plugs. The canal was dried and the fit of the size2 fiber post was checked. The post was then luted into the prepared root canal using resin cement (Calibra, Dentsply) according to manufacturer's instruction (Fig1. h).

In the subsequent appointment in order to improve the esthetics, the area of fracture line was roughened and a direct composite veneering was done(Fig1.i). Patient was recalled after 1 month, the tooth was found to be asymptomatic and remained aesthetically pleasing.



Fig1.a

Fig1.b

Fig1.c



Fig1.d

Fig1.g



Fig1.e

Fig1.f



Fig1.h



Fih1.i

III. Discussion

With advancement in dental bonding technology, it is now possible to achieve excellent results with reattachment of the dislocated tooth fragments provided that the biologic factors, materials, and techniques are logically assessed and managed.⁸ The use of natural tooth substance clearly eliminates the problems of differential wear of restorative material, unmatched shades, and difficulty of contour and texture reproduction associated with other techniques. Treatment plan can be made after evaluation of the periodontal, endodontic, coronal, and occlusal status.⁹ The direction of the fracture line is an important aspect in restorability, and it has a direct bearing on the prognosis of teeth. In this case report fracture line was above the gingival margin. Lest the treatment procedure would have been different. Post was provided in this case for additional retention. The newer variety of nonmetallic posts is made of either ceramic or fiber-reinforced materials such as carbon, quartz, or glass in an epoxy matrix.

Tooth-colored fiber posts have several advantages. They are more esthetic, bonded to tooth tissue, modulus of elasticity similar to that of dentin, and have less chances of fracture. Using glass fiber post with composite core and with recent advances in adhesive techniques and materials, one can create a monoblock, a multilayered structure with no inherent weak interlayer interfaces. The unique advantage of this system is that it reinforces the teeth structure through this concept. Therefore, the integrity of the final endodontic restorative continuum monoblock approaches that of the original healthy tooth itself.¹⁰

If the fracture line is supragingival, the procedure for reattachment will be straightforward. However, when the fracture site is subgingival or intraosseous, orthodontic extrusion with a post-retained crown may be necessary. Alternatively, surgical techniques such as electrosurgery, elevation of tissue flap, clinical crown lengthening surgery with removal of alveolar bone, and removal of gingival overgrowth for access to the fractured site are all viable methods for bonding fractured component. It has been suggested that whenever the fracture site invades the biologic width, surgery should be performed with minimum osteotomy and osteoplasty.¹¹

Some techniques of fragment reattachment include a bonding procedure without any type of wearing of the remaining tooth or tooth fragment surfaces. This technique is called simple reattachment.¹² However, some authors advocate wearing the tooth surfaces prior to or after bonding. The purpose of techniques like external chamfering or over contour and internal dentinal groove reattachment is to obtain optimal esthetics, retention, and function.¹³

Finally, treatment in the anterior region is considered a success only when the function and health of soft tissues and the remaining dental structures are recovered. The esthetic aspects of the restoration are equally important nowadays because of the high psychosocial and emotional impact on individual's quality of life.

Original tooth fragment reattachment can be considered the best option to recover fractured anterior teeth as it overcomes any prosthetic treatment.

IV. Conclusion

Reattachment proved to be a successful technique in the present case reports for restoring esthetics and function. However, because few long-term studies have been reported in the literature, the patient should be informed of possible interim nature of the treatment. For traumatized patients with broken teeth, pain relief and immediate esthetic restoration fragment reattachment fulfill the treatment goal.

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