

Re-attachment of Anterior Teeth Fragments : A Conservative Approach

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Abstract

Coronal fractures of the anterior teeth are a common form of dental trauma that mainly affects children and adolescents. One of the options for managing coronal tooth fractures when a tooth fragment is available and there is no or minimal violation of the biological width is the Re-attachment of the dental fragment. Re-attachment of fractured tooth fragments can provide good and long-lasting esthetics (because the tooth's original anatomic form, color and surface texture are maintained). It also restores function, provides a positive psychological response and is a relatively simple procedure. Patient cooperation and understanding of the limitations of the treatment is of utmost importance for good prognosis. Re-attachment of fractured tooth fragments offers a viable restorative option for the clinician because it restores tooth function and esthetics with the use of a very conservative and cost-effective approach. This article reports coronal teeth fracture cases that were successfully treated using tooth fragment re-attachment.

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Introduction

Trauma to the permanent teeth is rather a common event among school children. Crown fracture presents almost 92% of all traumatic injuries of the permanent teeth. The anterior incisors are most commonly affected (80% central incisors and 16 % lateral incisors) due to the anterior position of the maxilla and tooth protrusion. The aim of this case report is to propose the method of reattachment of the original tooth fragment for reconstructing the crown fractures of permanent incisors.

Chosack and Eildeman describe for the first time in 1964 reattachment of tooth fragment after trauma of 12 years old child (1). They suggest fixation of post in the root canal after endodontic treatment and reattached to it the coronary fragment. They found this reconstruction as temporary before introduction of adhesive dentistry.

Re-attachment should be the first choice when re-constructing fractured teeth and the fragment is available. This method has a number of advantages shown in clinical and experimental studies.

Re-attached fragment to a great extent restores esthetics, as it uses the original tooth's shape, color, translucence and surface structure (2).

Re-attachment of tooth fragment of anterior teeth is easy to practice and economical method that has the potential to assume the incisal strength during tooth functioning. The method ensures increased wearing steadiness and thus creates better function (3). Other advantages of this method are the psychological comfort of patient, less time spent in dental chair, exact reconstruction of tooth's morphology and usage of structure that wears out as the antagonists (4). This article reports on a coronal tooth fracture case that were successfully treated using tooth fragment re-attachment.

Case Report

A 17-year-old patient presented at the emergency clinic after sustaining a complicated crown fracture to maxillary left central incisor during sports activities. Upon examination, the treatment options were presented to the patient and to her legal guardian, including (1) No treatment, (2) Post and Core and Crown, (3) Crown buildup restoration with a Resin based composite and (4) Re-attachment of the tooth

fragment. The gingival aspect of the fractured site revealed a shallow, knife-edge subgingival fracture margin. Upon probing this area during the clinical examination, it was determined that the biological width was only minimally invaded and that bone recontouring via crown lengthening would not be indicated or required as long as the restorative margin were placed, at or above the level of cement-enamel junction. The tooth fragment comprised two pieces, one of which consisted of the majority of the coronal aspect, and the other was a small and thin fragment corresponding to the gingival aspect of the fracture site. After consultation with a periodontist, the strategy followed consisted of discarding the small gingival fragment, recontouring the shallow, knife-edge fractured area in the root of the tooth and reattaching the coronal fragment. To gain access to the subgingival fracture line and verifying that the fracture did not extend apically, a lingual flap was raised. A 1-mm tissue collar was removed from the mesiopalatal aspect of the tooth. The root surface was then re-contoured with a finishing bur to obtain a smooth surface that facilitated tissue healing. The operating field was isolated to ensure moisture control. The endodontic temporary restorative material was removed from the pulp chamber and the entrance of the root canal was sealed with a Glass Ionomer plug (Vitrebond, 3M ESPE, St. Paul, MN, USA). The pulp chamber, dentin and enamel were etched with 37% phosphoric acid gel, rinsed and coated with an ethanol-based adhesive system (Adper Single Bond Plus, 3M ESPE) and the fractured surface of the fragment was treated with 37% phosphoric acid gel for 30 seconds, followed by delicate rinsing. The adhesive system was then applied to the etched surface. Composite resin (Venus, Heraeus Kulzer, Dormagen, Germany) was applied to both fragment and tooth surfaces. The fractured segment was then accurately placed on the tooth, paying special attention to the fit between the segments. When the original position had been reestablished, excess resin was removed and the area was light cured for 40 seconds on each surface, making sure that no displacement of the fragment occurred before adhesive/resin polymerization completed. The margins were properly finished with diamond burs and polished. The occlusion was carefully checked and adjusted and the patient was dismissed after

receiving instructions to avoid exerting heavy function on this tooth and to follow regular home care procedures relative to oral hygiene. The patient and the patient's mother were informed that the reattachment line might be visible, and, if necessary, this could be managed in future visits. experience indicate that the re-attachment of fractured coronal fragments results in successful short- and medium-term outcomes. Fabrication of a mouth guard and patient education about treatment limitations may enhance clinical success as re-attachment failures may occur with a new trauma or parafunctional habits. With the materials available today, in conjunction with an appropriate technique, esthetic results can be achieved with predictable outcomes. Thus, the re-attachment of a tooth fragment is a viable technique that restores functions and esthetics with a very conservative approach, and it should be considered when treating patients with coronal fractures of the anterior teeth, especially younger patients.



Pre-operative radiograph and Photograph



Flap elevated



Fractured segment

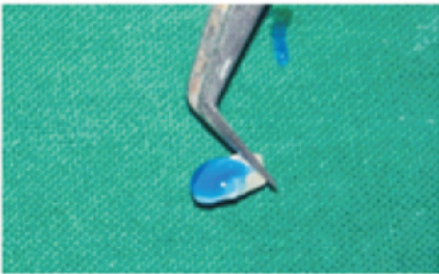
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Electro-cautery done to control bleeding



Application of etchant and bonding agent to the tooth and fractured segment



Re attachment of fractured segment and suturing



adhesive dentistry.

References

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Discussion

The technique described in this case report is reasonably simple, while restoring the function and esthetics with a very conservative approach. However, the professionalism 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

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