

A Novel Conservative Approach Of Fragment Reattachment : a case report

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Abstract

Crown reattachment is the most conservative treatment approach used to restore fractured tooth, presumably with sufficient strength, while maintaining original contour, incisal translucency, and subsequently reducing chairside time and cost. This article presents a case of an 18-year-old male with fractured left maxillary central incisor. Reattachment of the fractured fragment was done using a bonding technique and light cure composite followed by Splinting of the fractured tooth. The techniques described in this case report for reattachment and splinting are reasonably simple and novel, while restoring providing long-lasting esthetics, improved function, positive psychological response with a very conservative approach.

Keywords

Crown reattachment, bonding, splinting, trauma.

Introduction

A trauma with associated anterior tooth fracture is a devastating experience for the patient which demands prompt attention, not only because of dentition damage but also because of the trauma's psychological influence⁽¹⁾

Tennery (1988) was the first to describe the use of the acid-etch procedure to repair a fractured fragment⁽²⁾. Similar situations were later reported to be successful by Starkey (1979) and Simonsen (1982)^(3,4). The introduction of composite, combined with the use of an acid-etch procedure to attach composite to enamel, allowed for minimal preparation and repair of the fractured incisor^(5,6). Composite resin, on the other hand, has the disadvantages of lower abrasion resistance compared to enamel, water sorption and discoloration⁽⁷⁾.

There are new possibilities that permit for adequate union in the critical enamel-free cervical area. As a result, the risk of minor leaks and their repercussions is reduced. In this regard, the potential of acid etching vital or non-vital dentin, followed by application of a hydrophilic adhesive, appears to maximize the chances of success in such cases.



Figure 1 : a) Pre-operative radiograph; b) Pre-operative clinical photograph; c) Fragment approximation using Composite; d) Splinting (immediate post-operative).

Case Report

A healthy 18-year male patient reported to the department with the chief complaint of broken tooth in upper front region of the jaw when he experienced trauma to middle third of the face due to fall from staircase 12 hours ago.

On examination, there was complicated crown fracture with respect to permanent left maxillary central incisor. There was no soft tissue injury or injury to adjacent tooth structures (Figure 1: b).

After careful evaluation of the adjacent structures, radiographs were taken at three different angulations, which revealed no root fracture (Figure 1: a)

Patient was symptomatic and complained of sensitivity of teeth on exposure to hot or cold. Cold sensibility test was performed using Roeko Endofrost (Coltene, Whaledent) using right maxillary central, right and left maxillary lateral incisors as control teeth. Cold test revealed sharp, shooting pain as compared to control teeth until application of the stimulus. Pain was instantly relieved on removal of stimulus which led to the conclusion about the reversible inflammatory status of the pulp.

Patient was anaesthetised and under proper isolation and aseptic condition, the mobile coronal tooth fragment was approximated with the remaining tooth structure and stabilized. The labial tooth fragment was carefully etched using 37% phosphoric acid (K-etch, etchant) for 20 seconds followed by thorough rinsing with saline, bonded using Prime&Bond (Dentsply) followed by curing for 20 seconds. A layer of flowable composite (A2, 3M ESPE) was applied to the bonded tooth surface and cured for 20 seconds (Figure 1 : c).

The trauma-inflicted fractured tooth was stabilized using semi rigid composite splint from canine to canine (Figure 1 : d). Post operative instructions were given and recall was scheduled after 24 hours.

Patient was asymptomatic after 24 hours. Following recall visits were scheduled at 4 weeks, 6 weeks and 8 weeks (Figure 4). Radiograph and cold sensibility test were performed at each recall visit to note the vitality status of the pulp and development of periapical changes.

Patient is kept under observation and follow up scheduled at 3, 6 and 12 months.

Discussion

According to published case reports, 85% of injured incisors fracture obliquely from the labial to lingual aspects, with the fracture line extending in an apical orientation. This trend has also been validated in an in vitro study⁽⁸⁾.

Case management gets more difficult when pulp vitality is involved. Because there are no bacteria associated with trauma, pulp exposure caused by tooth trauma has a better prognosis. Kanca described a case in which a patient's incisor was replaced with the original tooth fragment after it was fractured through the pulp. A vital pulp was revealed after a 5-year follow-up⁽⁹⁾. The instance of a patient with a cracked maxillary left central incisor with exposed dentin but no pulp exposure was described by Ozel et al.⁽¹⁰⁾. A self-etching adhesive and a microhybrid composite were used to attach the

tooth fragment. The restoration was deemed successful and the tooth remained vital at the 3-year follow-up.

In present case, the fractured fragment was palatally attached to the coronal tooth structure and the fractured fragment was approximated and etched and bonded to the remaining tooth structure. For this decision, we considered the size of the exposure, interval between the accident and treatment, age of the patient, and maturity of the roots.

Because we did not utilise intraradicular splints such as metal or fibre posts, we used adjacent teeth to splint the fractured tooth segment to reinforce the attachment. Splinting was done so that the reattached tooth is subjected to less trauma in the initial period and hence result in better success.

Conclusion

Splinting should be the first choice of treatment in traumatic dental injuries. If this fails, RCT can always be done and further restorative procedure can be carried out.

It offers an excellent restorative option for clinicians and patients because it restores tooth function and aesthetics.

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