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Rebond: A Case Report of 2 Reattachment Cases

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Abstract

The majority of dental injuries are due to fractures of which coronal tooth fractures are the most common. Rehabilitation of the coronal fractures has become easy with the advent of the adhesives in dentistry. Reattachment of fractured tooth fragments can provide good and long-lasting esthetics while maintaining the tooth's original anatomic form, color, and surface texture. In this article two coronal fracture cases successfully treated by means of reattachment have been reported.

Keywords: Crown fracture, dental trauma, permanent teeth, treatment

Introduction

The most common type of the dental injury is the coronal fractures involving the maxillary anterior teeth, the prevalence of which is more in adolescents (1, 2). It becomes challenging for the clinician to maintain the esthetics while conserving the tooth structure. However with the advent and improvements in adhesives over a period of time in dentistry the procedure of reattachment has become a boon for conservation of the fractured tooth. Reattachment procedure has many advantages: it restores esthetics, as it uses the original tooth's shape, color, translucence and surface structure(3), ensures increased wearing steadiness and thus creates better function(4) , 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(5,6) and hence should be the first choice when reconstructing fractured teeth and the fragment is available.

This article reports on two coronal tooth fracture cases that were successfully treated using tooth fragment reattachment.

Case Report 1

A 22 year old male patient came with chief complaint of fractured upper maxillary right lateral incisor and upper left central incisor with a history of fall 15 days back .The intraoral and radiographic examination revealed an horizontal fracture in cervical third of the tooth with the involvement of pulp(Ellis class 3) in 12 and fracture at the incisal third(ellis class 2) of 21. The horizontal fracture line extended labio lingually with the palatal fragment

intact in relation to 12. Preoperative assessment and diagnosis was done to evaluate vitality (cold test) where in 12, 11 showed delayed response and 21 showed positive response. Upon thorough clinical examination the process of reattachment was initiated for 12 with the consent of the patient (figure 1(a)).

After the completion of the root canal treatment in relation to 12 and 11(figure 1(b), a fiber post was placed by placing a internal groove in the fractured fragment palatally in relation to 12(figure 1(c)). After the stabilization of the fragment it was bonded to the remaining tooth by the regular etching and bonding procedure. The upper left central incisor with Ellis class 2 fracture was also treated with composite build up (figure 1(d)).

Figure 1 (a)

Figure 1(b)

Figure 1 (c)

Figure 1 (d)

Case Report 2

A 17 year old male patient came with the chief complaint of fractured upper front teeth 2 days back. The clinical and radiographic examination revealed complicated vertical fracture in relation to 22 involving pulp (figure 2(a),(b)) . One important complication of this case was the subgingival extension of the fractured margin on the distopalatal area. The gingival aspect of the fractured site revealed a shallow, knife-edge subgingival fracture margin.

Upon probing this area, 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 the cementoenamel junction. Various treatment options were explained to the patient and with the consent of the patient the procedure of reattachment was initiated.

The fractured fragment was cleaned with 2% digluconate chlorhexidine and stored in saline to prevent dehydration

(figure 2 (c)). The tooth was root canal treated and the canal was prepared for placement of the fiber post. The fiber post was placed and cemented in the canal with resin cement. The rough edges of the fractured fragment were smoothened and were stabilized with the tooth and the fiber post by placing an internal groove in the fragment (figure 2(d)). The crown fragment and the tooth remnant were acid etched for 30 seconds with 35% phosphoric acid gel, rinsed for 30 seconds and dried with air spray. A conventional two bottle adhesive system (Scotchbond Multi-Purpose Plus, 3M ESPE) was applied on the enamel. After juxtaposition of the fragment with the tooth, they were light-cured for 40s buccally and 40s lingually(figure (e)) . The patient was kept on periodic review and it was observed that both endodontic and restorative treatments remained clinically acceptable through each visit.

Figure 2(a,b) (buccal and palatal view)

Figure 2(c)

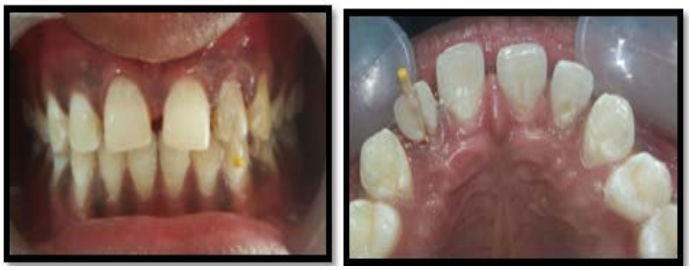


Figure 2(d) (buccal and palatal view)

Figure 2 (e)

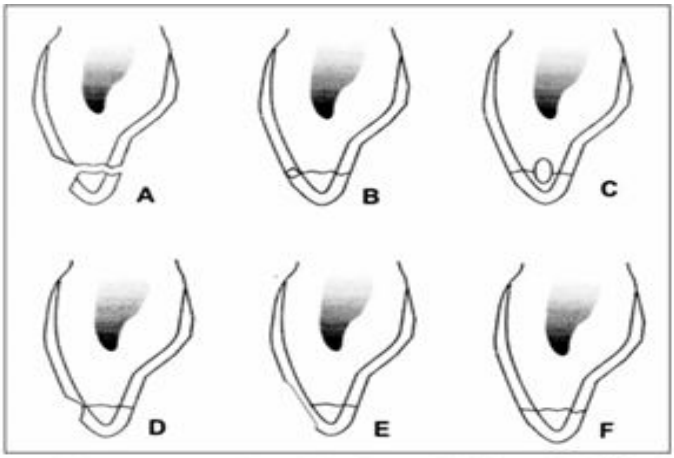
DISCUSSION:

Chosack and Eildeman for the first time in 1964 described reattachment of tooth fragment after trauma of 12 years old child (7). Various factors influence the management of crown root fractures that is extent of fracture (biological width violation, endodontic involvement, alveolar bone fracture), pattern of fracture and restorability of fractured tooth, fit between fragment and the remaining tooth structure, amount of dehydration of the fractured fragment, esthetics, finances, and prognosis(8-10)

Various techniques were advised for reattachment techniques like enamel beveling, v-shaped internal enamel groove, internal dentinal groove, external chamfer, over contour, simple reattachment ,of which placement of an internal groove was found to be an excellent alternative when the remnant and fragment fit well, while an over contour should be used in cases where the loss of structure occurred in a fractured site (11)(figure 3). In the above cases both internal groove followed by over contouring was done in order to increase the fracture strength of the tooth.

The resistance of the fracture segment can be directly proportional to the surface area of adhesion. The highest fracture resistance was obtained by chemically cured composite followed by light cured and resin cement and least by only dentin bonding agent(11). In the above two cases the teeth were root canal treated and were reinforced with the fibre post which has advantages of being more aesthetic, bonded to tooth tissue, modulus of elasticity similar to that of dentin and have less chances of fracture. The use glass fiber post with composite core with recent advances in adhesive techniques and materials helps in creating Monobloc, which is a multilayered structure with no inherent weak inter-layer interfaces which helps in reinforcing the tooth(12)

In both the above cases the fracture line was supragingival with no or minimal invasion of the biological width for which helped in achieving satisfactory esthetics and function. The success rates of reattached fragments has been seen to be up to 90 % for the parameters of periodontal, pulpal and color harmony for a follow up of upto 24 months(13) .The above cases were followed upto a period of 12 months with satisfactory result.



The most common reattachment techniques for uncomplicated fractured teeth. (A) Enamel bevelling; (B) V-shaped internal enamel groove; (C) Internal dentin groove; (D) External chamfer; (E) Overcontour and (F) Simple reattachment.

Figure 3

Conclusion

Reattachment has been proved to be a successful technique in the above cases for restoring immediate esthetics and function. However, the patient should be informed about the possible interim nature of the treatment as mentioned in the literature.

Clinical Significance

Reattachment 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.

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