

Aesthetic Management of Fractured Crown Segment: A Case report

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Abstract

Maxillary anterior teeth are more prone to dental injuries for which patients look for instant dental treatment. Immediate reattachment of the intact fractured tooth segment is a restorative choice in such cases. This case report presents a case of fractured segment reattached successfully by the adhesive technology. It allows the restoration of original tooth contour, colour and aesthetics in a single appointment.

Key words: Crown fracture, reattachment, esthetics.

Introduction

Children and young adults are more prone to trauma in their anterior tooth region. The reported percentage of simple (enamel and dentin) and complex (enamel, dentin and pulp) coronal fractures in children due to trauma are 28-44% and 11-15% respectively.¹ The teeth most susceptible to fractures caused by direct trauma are the maxillary central incisors. Traumatized incisors usually fracture in an oblique fashion from labial to lingual aspect with fracture line proceeding in an oblique direction. Management of crown fractures of the maxillary anterior teeth with regard to aesthetics is always a challenge to the clinician. The traditional approach for rehabilitation of fractured anterior teeth include composite restoration, post supported prosthetic restoration and in some cases fixed prosthetics followed by extraction. If a broken fragment is available, the restoration of a tooth with its own fragment has been suggested as an alternative treatment.² The success of reattachment depends on the following factors such as, the site of fracture, size of fractured remnants, periodontal status, pulpal involvement, maturity of the root formation, biological width invasion, occlusion, time material used for reattachment, use of post and prognosis.³

The advantages of this alternative treatment method include.^{2,4,5}

- The colour and size of the original tooth can be regained.
- Has favorable wear mechanism and helps to preserve occlusal contacts.
- The patient's psychological trauma of tooth lost can be addressed immediately, thereby enhancing the patient's morale.
- Less time-consuming, economical and conservative nature of the treatment.

Case report

Following trauma, a 25-year-old male patient reported with a complicated crown root fracture in the maxillary anterior tooth. The trauma occurred due to a fall and he reported immediately with a fractured coronal segment. Initial clinical examination reveals pulp exposure on maxillary left lateral incisor tooth which was tender on percussion. No soft tissue injury was noticed. A horizontal fracture line was seen 2mm supragingivally at the labial

and palatal aspect of the maxillary left lateral incisor tooth (Figure 1). After complete history-taking and medical examination, a treatment plan was prepared to immediately reattach the broken fragment of the teeth. Under local anaesthesia, the fractured coronal fragment was removed with a forceps without damage. Pulp chamber was cleaned by removing all pulp tissue and stored in saline. Endodontic therapy was completed under rubber dam isolation. The root canal was then prepared with a parapost drill (3M) by removing 7 mm of gutta percha from the canal. A pre-fabricated fiber-reinforced post was then selected for coronal attachment. To accommodate the post, a retention box was prepared in the coronal fragment using a no 4 round bur (Diatech) (Figure 2). Post was cemented using resin cement (Panavia F 2.0, Kuraray Medical Inc) (Figure 3). The fractured crown segment and the tooth were etched for 10 seconds with 37% Ortho Phosphoric acid. Dentin bonding agent (Prime and Bond) was applied with a disposable brush and left in place for 30 seconds. The flowable resin composite (Tetric Flow, Ivoclar vivadent) was applied to the fracture surface of both parts and the fragments were reattached to their places and cured with Smartlite LED (Dentsply) curing light for 20 seconds. Final finishing and polishing were performed after suitable occlusal corrections were made (Figure 4). Patient was asked to report after 24 hours for follow-up and it was found to be uneventful. Similar follow-ups were carried out after 6 month and 1 year. The healing was found to be uneventful during that period.

Discussion

Reattachment of coronal fragment is preferred due to its non-technique sensitive procedure and low cost. The reattached tooth is restored to its original form, contour and margins which tend to be more compatible with the gingiva. The psychological trauma caused to the individual due loss of aesthetics can be managed by this procedure successfully. In the absence of a luxation injury, this technique can be considered.⁶ In the pre-adhesive era, fractured teeth needed to be restored either with pin-retained inlays or cast restoration that sacrificed the healthy tooth structure and were a challenge for clinicians to match with adjacent teeth. The development of adhesive dentistry has allowed the dentist to use the patient's own fragment to be restored

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Figure 1: Preoperative image



Figure 2: Retention groove on fractured tooth segment was made



Figure 3: Luting of fiber-reinforced composite post done



Figure 4: Fractured segment reattached, finishing and polishing done

to the fractured tooth.⁷ When the fractured part is still available, reattaching it to the remaining tooth in the mouth is an alternative treatment. In this study, the reattached tooth was evaluated with respect to the periodontal, pulpal, coronal, color harmony, occlusion and patient satisfaction levels. In the clinical examination of the patient, periodontal tissues at follow-up, swelling and discoloration in the vestibular gingival, abscess, sinus and loss of stippling were evaluated and none of these symptoms were observed in the patient. These results are in agreement with previous reports.⁸⁻¹⁰

Conclusion

1. Coronal fragment reattachment was found to be a successful treatment method.
2. The combination of the flowable resin composite and the hybrid resin composite which were used to reattach the tooth's fractured incisal part was successful.
3. In terms of patient satisfaction levels, this reattachment method was found to be highly successful and the patient was reported to be highly satisfied.

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