CASE REPORT

Fragment reattachment of fractured anterior teeth in a young patient with a 1.5-year follow-up

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SUMMARY

Crown fracture of maxillary anterior teeth is relatively common among children and teenagers. Aesthetic rehabilitation of crown fractures of the maxillary anterior is one of the greatest challenges to the dentist.

Reattachment of a fractured fragment to the remaining tooth can provide better and long-lasting aesthetics, improved function, a positive psychological response and is a faster and less-complicated procedure. This article presents a case of reattachment of anterior tooth with a coronal fracture involving enamel, dentin and pulp with a 1.5-year follow-up.

BACKGROUND

The majority of dental injuries involves the anterior teeth, especially the maxillary incisors (because of its position in the arch), whereas the mandibular central incisors and the maxillary lateral incisors are less-frequently involved.¹⁻² Dental trauma often has a severe impact on the social and psychological well-being of a patient.

Coronal fractures of permanent incisors represent 18–22% of all trauma to dental hard tissues, 28–44% being simple (enamel+dentin) and 11–15% complex (enamel+dentin+pulp). Out of these 96% involve maxillary central incisors.³

Dental injuries usually affect at most a single tooth; however, severe trauma such as automobile accidents and sports injuries involve multiple teeth. 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, aesthetics, finance and prognosis.⁴⁻⁶

Patient cooperation and understanding of the limitations of the treatment is of utmost importance for good prognosis. When there is a substantial periodontal injury and/or invasion of the biological width, the restorative management of the coronal fracture should follow the proper management of those associated tissues. Coronal fractures must be approached in a systematic way to achieve a successful restoration.

Although evidence-based literature shows that materials do not play an important role in fracture strength recovery, the advantage of reattachment of fractured fragments include immediate aesthetics, more reliable outline form, possibility of maintaining

the occlusal function, absence of differential wear, lowered economic burden and excellent time resource management.⁷

CASE PRESENTATION

A 12-year-old boy reported to the outpatient section of Department of Paedodontics and Preventive Dentistry of VSPM Dental College with a chief complaint of pain in the upper anterior region of jaw. The patient gives a 1-day history of trauma to the maxillary right central incisor while playing in school ground. There was no history of epistaxis, unconsciousness and laceration in and around the oral cavity after the trauma.

After examination of the patient the dentition was found to be of mixed dentition stage with the fracture of maxillary right-central incisor. Fractured tooth according to Ellis and Davey was of Class III at the cervical one-third involving the enamel, dentin and pulp. The fractured segment of the tooth was seen palatally attached and separated labially. The patient gives no history of any bleeding or swelling associated with the tooth.

Figure 1 Postobturation intraoral periapical radiograph.

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Figure 2 Insertion of fibre post.

TREATMENT

The treatment plan for the patient comprised of single-sitting root canal treatment followed by placement of a fibre post for retention (figure 1). The fractured segment was separated from the tooth. Fractured segment was preserved in Hank's balanced salt solution to prevent dehydration. Root canal treatment was done and the fibre post was inserted (figure 2). The tooth was isolated and a mock placement of the fragment into position was done to evaluate the result. Later the periphery of the retained portion of central incisor was etched with 37% phosphoric acid for 15 s and thoroughly rinsed off. A bonding agent was applied to both the substrates and the fit was reverified. The excess composite was removed and polymerised from both buccal and palatal sides, light cured for 40 s. Reattachment was done by using flowable composite (figures 3 and 4). Finishing and polishing of the tooth was done. All instructions regarding precaution of treated tooth, diet and oral hygiene maintenance were given. The patient was kept under observation and initially follow-up at weekly intervals.

OUTCOME AND FOLLOW-UP

Tooth was asymptomatic with no postoperative complications after a follow-up of 1.5 year (figure 5).

DISCUSSION

Coronal fractures must be approached in a systematic way to achieve a successful restoration. One of the options for managing coronal tooth fractures, especially when there is no or minimal violation of the biological width, is the reattachment of the dental fragment when it is available. Tooth fragment reattachment offers a conservative, aesthetic and cost-effective restorative option that have been shown to be an acceptable alternative to the restoration of the fractured tooth with resin-based composite or full-coverage crown. Reattachment of a fragment to the fractured tooth can provide good and long-lasting aesthetics because the tooth's original anatomic form, colour

Figure 3 Reattachment of tooth fragment.

Figure 4 After reattachment.

and surface texture are maintained. It can restore function, can result in a positive psychological response and is a reasonably simple procedure. In addition, tooth fragment reattachment allows restoration of the tooth with minimal sacrifice of the remaining tooth structure. Furthermore, this technique is less time-consuming, economical and provides a more predictable long-term wear. The psychological trauma caused to the individual owing to loss of aesthetics can be managed by this procedure successfully. When a tooth has not sustained a luxation injury, this technique should be considered.

Hayashi *et al*⁸ indicated that, the best restorative methods are needed to be identified for teeth with extensive loss of structure, and reinforcing pulpless teeth. However, when a tooth has more than 50% of its coronal structure missing, the use of a post-and-core foundation is recommended prior to restoration. Extensive damage of the tooth structure and missing fragment warrants reinforcement using fibre posts. In recent literature reviews, it has become clear that fibre posts do not strengthen endodontically treated teeth, and their use is justified only for retention of the coronal restoration.⁹ Tooth coloured fibre posts have several advantages. They are more aesthetic and bond to tooth tissue. The use of fibre post increases retention and distributes the stress along the root, with the help of the glass fibre post the fractured crown can be permanently bonded to the root. Fibre-reinforced composite resin post has demonstrated negligible root fracture.¹⁰ In addition, the fibre-reinforced posts can be used with minimal preparation because it uses the undercuts and surface irregularities to increase the surface area for bonding. Thus, it reduces the possibility of tooth fracture during function or traumatic injury.¹¹

Figure 5 Follow-up of 1.5 year.

Learning points

- ▶ Tooth fragment reattachment offers a conservative, aesthetic and cost-effective restorative option that has been shown to be an acceptable alternative to the restoration of the fractured tooth over resin-based composite or full coverage crown.
- ▶ Tooth's original anatomic form, colour and surface texture are maintained.
- ▶ Procedure results in a positive psychological response.
- ▶ It is a reasonably simple procedure.

Competing interests None.

Patient consent Obtained.

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