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Reattachment of Fractured Tooth Fragment With Fiber Post And Core : Case Report

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Abstract

Coronal fractures of the anterior teeth are common sequelae of dental trauma. In case of complex fractures, where the fractured segment is available and there is close approximation of the segment to the remaining tooth, root canal treatment followed by reattachment of the fractured segment with fiber post reinforcement is a feasible option. The procedure is simple and economic and needs less chair-side time as compared to many conventional methods. In addition, the procedure provides good and longlasting esthetics, because the original morphology, color, and surface texture are maintained. This paper reports case of complex coronal tooth fracture successfully managed using tooth fragment reattachment with 1 year follow up.

Keywords: Fiber, Fracture, Morphology.

Introduction

Complicated crown fractures involving the enamel, dentin, and pulp constitute a major share of all dental injuries and are most common in maxillary central

incisors [1, 2]. A fractured anterior tooth requires immediate clinical attention and, if untreated, can cause damage to dentition and even have a psychological impact on the patient [1]. Management of complicated crown fractures is a multifactorial process influenced by the extent and pattern of fracture (biological width violation, endodontic involvement, alveolar bone fracture), restorability of fractured tooth (associated root fracture), secondary injuries (soft tissue status), presence/absence of fractured tooth fragment and its condition for use (fit between fragment and the remaining tooth structure), occlusion, esthetics, finances, and prognosis [3]. In case of complicated fractures where the fractured segments are closely approximating, root canal treatment (RCT) followed by reattachment of the fractured segment with fiber post reinforcement is a feasible option [3]. It has been suggested that fiber post luted with resin cement increases the retention of the segment and also provides a monoblock effect [4]

Case Report

A 27 year old male patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of fractured teeth and also complaints of pain in the left upper front region of the jaw since 7 days. Patient had no systemic diseases. Patient was alright 7 days back, he had trauma in anterior region of jaw due to road traffic accident, and got fractured tooth fragment inside his mouth, and was complaining of severe pain which was intermittent in duration & sharp in nature.

Clinical and radiographic examination revealed a complicated oblique crown fracture of 21 that extended subgingivally in the palatal aspect. The fractured segment was held in place by the gingival attachment. Fracture line runs through the pulp chamber extending from labial side obliquely to palatal side. Class III fracture of 22 was also noted but the fractured segment was missing. Tenderness on percussion was present with 21,22. No soft tissue trauma intraorally. Periapical radiographs revealed an intact periodontal ligament space, complete root formation, and no root fracture in relation to both teeth. Radiograph of the affected tooth shows an oblique fracture line at middle third of tooth surface. Normal periradicular bony architecture. Medical history was noncontributory.

Local anesthesia was administered and the fractured segment in relation to 21 was atraumatically removed . It was then cleaned with 2% chlorhexidine solution and stored in isotonic saline solution. RCT was completed on 21 and 22 & post space was prepared with 21 using GG drills and Peeso reamers. To gain access to the gingival extent of the fracture line and to better evaluate its relation to the bone crest, palatal gingivectomy with diode laser was performed with 1mm of osteotomy and osteoplasty as fracture line was at alveolar crest level. Esthetic post of suitable diameter was selected. The prepared post space was etched for 15 seconds using 37% phosphoric acid. It was then rinsed thoroughly with water and excess water was removed with a cotton pellet and paper points. Next the adhesive was applied on the etched surface as well as the post. The adhesive was air thinned and light-cured for 20 seconds. The same procedure was performed for fractured fragment. The post was then luted with dual cure resin cement with 1.5 -2 mm of its coronal portion extending into the chamber . Tooth fragment was reattached using flowable resin cement which was filled in groove. Finishing and polishing of margins done. Occlusal adjustment done.

Discussion

Conventional methods employed in the restoration of fractured teeth include partial and full coverage crowns, laminate veneers, and composite resins all of which are timeconsuming, high priced, and not conservative [2]. First described by Chosack and Eidelman in 1964, restoration of fractured teeth using the dental fragment offers a fine way to reinstate the natural shape, contour, surface texture, occlusal alignment, and colour of the fragment [5]. In addition, tooth fragment reattachment allows restoration of the tooth with minimal sacrifice of the remaining tooth structure [3]. A growing number of case reports in the literature suggests that reattachment of a fractured tooth fragment is a viable approach for the treatment of coronal fracture of anterior teeth when the fractured segment is available [1–3]. The success of the reattachment depends on several factors: hydration of the fractured segment while outside oral cavity is one of them. This is necessary to maintain the vitality and original esthetic appearance of the tooth and also ensures adequate bond strength [2]. In all the reported cases, after the coronal segment was separated, hydration was ensured by storage in sterile isotonic saline. When there is a substantial associated periodontal injury and/or invasion of the biological width, the restorative management of the coronal fracture should also consider the rehabilitation of those associated tissues [6]. In this case, the fracture line was extended subgingivally in the palatal area. On clinical examination, it was seen that the biological width was only minimally invaded and hence, osteotomy procedure was deemed necessary. Also, the restorative margin could be placed just above the level of the cementoenamel junction. To facilitate the perfect approximation of the fragments and finishing of the margins, gingivectomy and osteotomy was performed using diode laser. The postsurgical healing phase remained uneventful. Reinforcement of the reattached fragments using posts has been widely reported in the literature.

Although many techniques with various materials have been suggested, resinbased restorative materials with tooth-colored fiber post may be considered the best option because of several advantages such as a suitable elastic modulus, esthetics, good bonding between post and cement, lower chair time, and minimal tissue removal [7, 8]. It is also reported that the use of a fiber post with fractured teeth, as it interlocks the two fragments, minimizes the stress on the reattached tooth fragment [7–9]. In addition to the preparation of the post space, a vent was created in the coronal separated segment as a leeway for the excess cement to flow out

without buildup of any hydrostatic pressure. A similar technique has been recommended by Tosun et al. in reattachment using Ribbond material [10].

Conclusion

The case presented in this paper suggest that, with the materials available today along with appropriate clinical technique, reattachment of tooth fragment is a viable and conservative treatment option for fractured incisors. This restores function and aesthetics with a very conservative approach and can be considered when treating patients with coronal fractures of the anterior teeth, especially in younger patients. Future reports may need to focus on reporting longer followup to bolster the evidence in favour of this treatment option.

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