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Case Report OMICS International

A Case Report on Restoration of Traumatically Involved Teeth with Fiber Post and Esthetic Restoration

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Abstract

Background: The restoration of traumatically injured teeth with substantial loss of coronal structure entails endodontic treatment followed by post insertion into canal space so that foundation restoration can be strengthened to receive the crown. In this case report, such case is described with fiber-reinforced post and core system.

Case details: A 30-year-old lady with chisel-type fracture of upper front teeth was treated with endodontic treatment followed by fiber-reinforced post and metal-ceramic restoration.

Conclusion: The fiber reinforced restoration gives esthetically pleasing and biologically superior outcome in traumatically involved teeth.

Keywords: Fiber-reinforced post; Traumatized teeth; Post-and-core restoration

Introduction

When there is maximum destruction of coronal tooth structure a dowel and core restoration is required as foundation restoration of a crown [1]. The endodontic procedures tend to reduce tooth stiffness by 5-45% and mesio-occluso-distal preparation decreases the stiffness by 60% [2]. Water loss and loss of collagen cross-linking are the factors associated with brittleness of dentin of endodontically treated teeth [3-5].

A restoration lacking resistance form is not likely to be a long-term success, regardless of the retentiveness of the post [6,7]. Fiber posts have revolutionized the field of restoration of endodontically treated teeth. Technological advancement gave an ample opportunity to offer better esthetic and mechanical properties along with radiographically detectable quality in order to balance the advantages possessed by metallic cast posts [8-10]. Although fiber system was introduced in 1990, a long-term study was begun in 1988 when Friedriksson et al. [10] studied 236 teeth restored with posts.

Case Presentation

A 30-year-old lady who had an accident fracturing her multiple teeth reported to the hospital for her treatment. On examination, upper anterior teeth had chisel-type fracture (Figures 1A, 1B and 2). Some of teeth had large destruction owing to accident and coronal tooth structure was inadequate for restoration.

First, the endodontic treatment was carried out in all of her traumatized teeth [11-14] then the radiographs were taken (Figures 3 and 4). The tooth with greatest loss of coronal tooth structure [12] was judged to be a candidate for post-and-core restoration.

By using peeso reamers, gutta percha was removed and fiber-reinforced composite was placed. Then the foundation restoration was completed with composite resin.

Usual tooth preparation was carried out to fabricate metal-ceramic crowns in all the endodontically treated teeth (Figures 5-7).

Discussion

The result of various studies have confirmed the longevity of fiber post [10,15]. Flexural properties of fiber posts render them responsible for prevention of root fracture [16]. Similarly, there have been reports of increased fracture resistance with preformed fiber posts as compared to control group [17]. However, systematic review comparing the metal posts and fiber posts had outlined greater survival rate (90%) in contrast to fiber-reinforced posts (83.9%) with overall equal incidence of fracture of root [18]. In a 3-year follow-up, superior result in terms of clinical success was observed in teeth restored with fiber post [19]. In another study fiber-reinforced composite showed highest mean fracture resistance in comparison to nano-hybrid and silorane [20].

Figure 1A: Traumatically involved teeth.

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Figure 1B: 12 had chisel-type fracture with great bulk of coronal tooth loss.

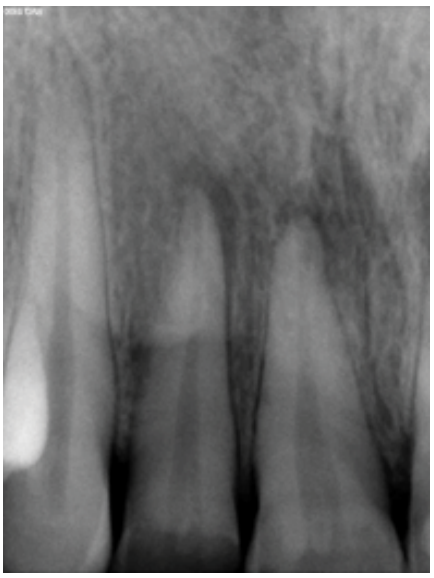

Figure 2: Pre-operative radiograph.

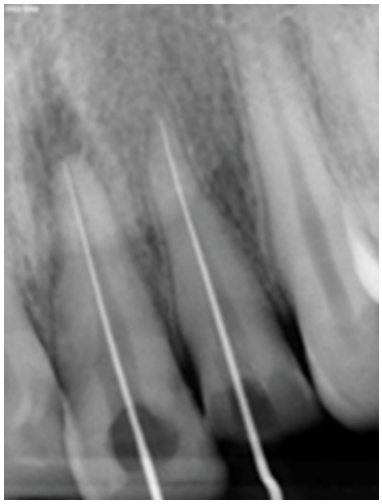

Figure 3: Endodontic treatment initiated in upper front four teeth.

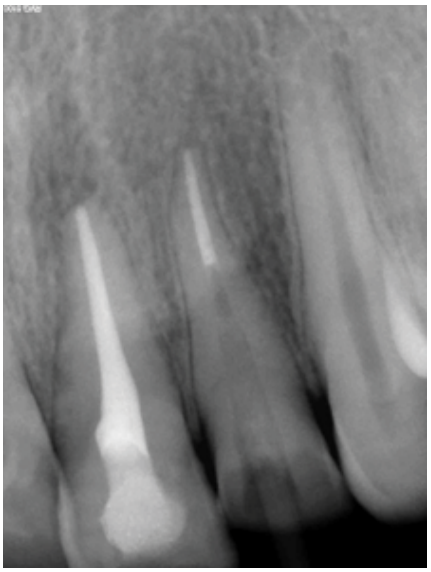

Figure 4: Gutta percha removed from badly broken tooth.

Figure 5: Prepared teeth for receiving final restorations.

Figure 6: Metal-ceramic restorations luted.

Anatomic post, individualized according to canal space anatomy, offers a great advantage in relation to retention without compromising other advantages of fiber-post [21].

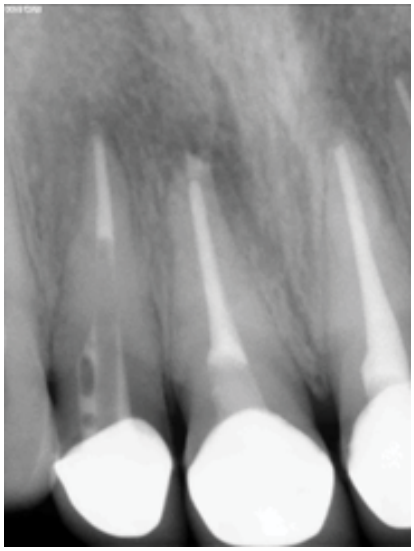

Figure 7: Post restoration radiograph.

Stress pattern inside the canal was studied in endodontically treated teeth using finite element analysis which yielded that maximum stress was in stainless steel followed by cast gold and carbon fiber post [22]. Similar study also revealed that less amount of dentinal stress in fiber-reinforced composite core as compared to other system [13]. However, role of incorporation of ferrule could not be overlooked to minimize the stress [13,14]. Therefore, only increase in diameter should not be the concern of restoration because it decreases the fracture resistance of root in gaining its ability to be stiff [23,24]. Fresno recommended thinnest possible diameter of dowel with adequate strength to resist fracture [25].

Conclusion

With use of fiber-reinforced composite post, the treatment of traumatically involved and endodontically weakened teeth can be easier and also more beneficial than other system. However, incorporation of various advantageous properties of post (ferrule effect, diameter, length, luting cement etc.) is of paramount importance for long-term success of such restorations.

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Conflict of Interest

The authors have no conflict of interest.

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