



MANAGEMENT OF ELISS CLASS IV FRACTURE USING FIBER POST : A CASE REPORT

Endodontics

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ABSTRACT

Coronal fractures of permanent anterior teeth by trauma are the most frequent type of injury. Many factors are considered in the effort to provide optimal mechanical properties, aesthetic, and longevity. The usage of Post and Core system for management of grossly mutilated tooth has been widely accepted and used. This paper will explain case report of a patient having fractured central incisor which was managed by Root canal treatment followed by fibre post and then a PFM crown, which was the minimally invasive treatment in this case.

KEYWORDS

Coronal Fractures, Grossly Mutilated Tooth, Post And Core System, Minimally Invasive.

INTRODUCTION:

The most frequent type of injury in the permanent dentition is seen as fracture of anterior teeth which mostly occur among children and adolescent reported up to 25% of the total patient population. If the fracture also exposes the dental pulp, it is known as the injury fracture or Class 3 fracture (Ellis and Davey classification). The incidence of complicated crown root fractures ranges from 2% to 13% of all dental injuries and the most commonly involved teeth are the maxillary central incisors.¹

The treatment of uncomplicated crown fractures is relatively simple involving recontouring, composite bonding or porcelain veneers. Complicated crown-root fractures on the contrary present challenge to the restorative dentist for its management because of encroachment of biologic width and its subgingival nature.²

Endodontically treated teeth that show coronal structure destruction and have undergone extensive restorations are usually rebuilt with post and core followed by prosthetic crown restoration.³

Among several techniques, posts, and materials for cementation and core build-up reported in the literature, cast post and core has been traditionally used due to its high mechanical strength and desirable fit in the root canal. prefabricated glass fiber posts have been used.^{4,5}

Case Report:

A 25 yr old male patient reported to us with a chief complain of broken upper front tooth. A clinical intraoral examination revealed loss of tooth structure upto the middle of the tooth, indicative of fracture of the tooth. There were no alveolar bone fractures or periodontal tissues injuries found during the examination. The fractured teeth revealed no swelling or associated sinus tract. The vitality tests (thermal and electric pulp test) of the fractured central incisors showed no response while the other teeth responded normally. The periapical radiograph was taken to confirm the clinical findings and to exclude the root/bone fracture, if present.

After clinical and radiographic examinations, it was diagnosed as Ellis Class IV. The reduced amount of tooth structure did not compromise the minimum ferrule of 2.0 mm desired with the use of pre-fabricated posts.

The fractured teeth were then endodontically treated using hand ProTaper hand files till F2 (Maillefer, Dentsply). 2.5% sodium hypochlorite solution was used as an irrigant and 17% EDTA solution was used to remove the smear layer. The canals were then dried with sterile paper points and calcium hydroxide paste was used as an intracanal medicament. After a week obturation was performed with ProTaper single cone gutta-percha of the corresponding size.(Fig.1)

After the endodontic treatment, Gutta-percha was removed with #2 Peeso Reamer of the system and the apical sealing was preserved. The final finishing was done with No. 3 Peeso Reamer. (Fig.2)

The coronal tooth preparation was done, and the enamel irregularities

were removed.(Fig.3) And then gutta-percha removal and root canal preparation was done, a periapical radiograph was employed to check the preparation quality and to select the fiber post size, according to the anatomical dimensions of the root canal.(Fig.4)

Post cementation was done with Rely X Unicem Self Adhesive Universal Resin Cement (3M ESPE, Germany) (Fig.5&6) followed by core build up with resin (Tetric N Ceram, Ivoclar Vivadent, Schaan Liechtenstein).(Fig.7)

The tooth was prepared to receive a veneered porcelain fused to metal crown. Cementation was done with Rely X U 100 (3M ESPE, Germany) a dual cure self-adhesive resin cement. Excess resin cement was removed after brief light exposure (app. 2 sec). Then light cured for 20 sec on each surface.(Fig.8)



Figure -1 (Post obturation radiograph)



Figure -2 (Post space prepared)



Figure -3 (Prepared after reduction)



Figure-4 (Fitting of Post checked)



Figure-5 (Rely X U 100 Cement)



Figure-6 (Luting of post)



Figure-7 (After Core build up finished tooth preparation)



Figure-8 (Crown Cementation)

DISCUSSION:

The restoration of endodontically treated teeth has always been an area of concern and the recent past has witnessed an implosion of interest in the field with regard to functional and esthetic problems. Following in the wake of changing treatment concepts, the material market for posts has undergone a complete makeover. Ranging from the era of wooden posts to metal posts and more recently, carbon fiber, glass fiber, and ceramic posts, the material and design options are infinite. In the last few years there has been an implosion of new materials, changing the trend toward prefabricated metal posts, resin-based composite cores, fiber reinforced resin-based composite posts and ceramic posts.⁶

The fiber-reinforced post offers clinical advantages with the ability of easy removal and being less traumatic. Like a cast or prefabricated post, fiber posts are not retrieved in one piece but are removed from the canal by drilling down directly through them⁷.

Fiber resin posts shows similar hardness to dentin and exhibits greater durability than the metal posts. Having elastic modulus similar to dentin strengthens the remaining tooth structure and increases resistance to tooth fracture. Because of these advantages, fiber post was used in this case to restore the fractured teeth with composite resins.^{8,9}

Fiber posts are ready to use whereas more time, extra clinic and laboratory time are required for the metal post.¹⁰

CONCLUSION:

Fiber post has better homogeneous tension distribution when loaded, than rigid metal or zirconium oxide ceramic posts. Fiber reinforced posts also possess advantageous optical properties over metal or metal oxide post systems. Therefore, a combined use of fiber posts provides satisfying esthetic results and improved mechanical properties.

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