

**MANAGEMENT OF COMPLICATED CROWN FRACTURE WITH CUSTOM MADE FIBRE REINFORCED COMPOSITE POST: A CASE SERIES.****Dr. M. Revathi,* Dr. Hemavati Walikar, Dr. Imyangluba, Dr. Rupali Athawale and Dr. Deborah Gonmei²**

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ABSTRACT

Management of traumatic injuries to the teeth is a challenge to the practising dentist. It has no prescriptive method for occurring, possesses no significant predictable pattern of intensity or extensiveness and occurring at times when dentists are least prepared for it. Ninety-two percent of traumatic injuries results in fracture of maxillary permanent central incisors because of its protrusive and anterior positioning. The young permanent maxillary central incisor root canal chamber is large and tapered. This paper describes the management of a patient with Ellis Class III fractured tooth in a young permanent maxillary central incisor by an innovative clinical procedure.

KEYWORDS: complicated crown fracture, fibre post, esthetics.**INTRODUCTION**

Loss of tooth structure due to fracture is a common occurrence in dentistry and is the third common cause of fracture other than dental caries and periodontal diseases.^[1] Loss of such tooth structure would either be a simple fracture involving enamel and dentin or could possibly involve the pulp. Endodontic therapy would be the treatment of choice if there is severe tooth structure loss involving the pulp.

Teeth that are endodontically treated have little coronal tooth structure remaining due to either prior pathology and/or endodontic treatment. Several in vivo studies have cited endodontic treatment as the major etiological factor for tooth fracture.^[2] These teeth with minimal tooth structure which is susceptible to fracture would ideally require a post to retain the core and the restoration. There is a belief that posts placed into the root canal teeth after endodontic therapy strengthens the teeth and reinforces the restored structure. But there are other studies which state that the preparation of post space and the placement of post in the weakened tooth structure would increase the possibility of root fracture.^[3, 4] They stated that posts should only be used when there is insufficient tooth structure remaining to support the final prosthesis. Hence, the main function of a post is the retention of the core to support the coronal restoration. Initially the posts used were metallic and were eventually replaced by the aesthetic fibre posts.

There are different fibre posts available in the market with different designs and techniques. This article provides two case report for the management of complicated crown fracture in young permanent maxillary central incisors with custom made FRC post.

CASE REPORTS

Two young male patients aged 12 years reported to the department of pedodontic and preventive dentistry, Government dental college and research institute, Bangalore, with the chief complaint of broken upper right front tooth due to accident. Both the patients had a history of trauma due to accident 5 to 10 days prior to reporting to our department. On examination 11 had complicated crown fracture and was non-mobile (fig-1,4). Intra oral periapical radiograph revealed fracture line involving enamel, dentine and approximating pulp. They were advised anti-inflammatory drugs and were recalled within a week. After a week, on examination there was no colour change but tooth was having continuous dull pain that was severely tender on percussion. Thermal test and Electric pulp test revealed abnormal response.

CASE REPORT 1.

Case report 1: Fig 1- preoperative extraoral smile and intraoral Ellis class III fracture with 11.



Case report 1: Fig 2- Fiber post placed in 11 and composite core build up.



Case report 1 : Fig 3- Postoperative Extraoral Smile and PFM crown on 11.

CASE REPORT 2:

Case report 2: Fig 4- preoperative extraoral smile and intraoral Ellis class III fracture with 11.



Case report 2: Fig 5 - Sectional obturation done and Fibre post placed in 11 and composite core build up.



Case report 2 : Fig 6- Postoperative Extraoral Smile and PFM crown on 11.

METHODOLOGY

Access cavity was prepared with endo access bur size 3 (Dentsply) and working length was determined using apex locator (Dentsply, X smart Duo) and confirmed by IOPAR. The canal was constantly irrigated with 3% sodium hypochlorite, saline and 17% EDTA solution. The canal was dried using paper points and intra canal medicament was placed for a week. After one week temporary access cavity restoration was removed and initial file binding to apical constriction was 25K file (MANI manufacturing). The apical constriction as enlarged till 40 K file (MANI).

Step back preparation was done with regular recapitulation and irrigation. The canal was finally shaped with M two basic sequence and advance sequencing. The canal was sectionally obturated with Guttapercha coated with AH plus sealer (Dentsply).

The department had Tenax Fibre Trans Esthetic tapered post of size 1.1 mm. This size fiber post was loosely bound to the tapered anatomy of root canal of both the incisors. This FRC post was reinforced with the Braided fibers (INTERLIG). The entire post was then etched with 37% phosphoric acid for 30 seconds and then washed, dried with three-way syringe. Bonding agent (3M ESPE, Single Bond) was applied with micro tip brush and cured for 40 seconds on each side. The composite (Filtek, 3M ESPE) was adapted on to the post and just like during custom made post the entire unit was taken and inserted into the root canal (Fig. 4). Then it was retrieved

immediately and cured for 40 seconds all around. The post dimensions were adjusted by yellow ring finishing bur. The canal was acid etched using micro brush. Bonding agent was applied and excess was removed using paper point. The custom made FRC post was silanized using silanating agent. Then it was luted into the canal using resin-based sealer (Multilink, IVOCCLAR).

The coronal restoration with composite was done and after tooth preparation the impression of teeth with rubber based impression material taken (fig- 2, 5). The temporary crown was placed using Zinc Oxide Eugenol sealer and patient was recalled after a week. During the treatment planning session, the patient was given the option of porcelain-fused-to-metal or metal-free restorations. The patient chose to have his tooth restored with porcelain fused to metal crown and So, esthetic improvement was done with the same (fig - 3, 6).

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.^[5]

The traditional custom-cast dowel core provides a better geometric adaptation to excessively flared or elliptical canals, and almost always requires minimum tooth structure removal.^[6]

Custom cast post-and-cores adapt well to canals with extremely tapered canals or those with a noncircular cross section and/or irregular shape, and roots with minimal remaining coronal tooth structure. This technique incorporates the advantages of both FRC post and custom-made post.

FRC posts were introduced as an aesthetic alternative; their use is based on the mechanical notion that materials restoring endodontically treated teeth should have similar mechanical properties with that of tooth substance.^[7]

Composite posts possess an elastic modulus close to that of dentin, thus creating a more homogenous restorative system consisting of the post, resin cement, core material along with the tooth substance. In this way, distribution of stresses to the root is more even and there is less risk of a root fracture.^[8]

Weine has stated that more endodontically treated teeth are lost due to improper restoration than to endodontic failure.^[9]

To conclude, These case reports presented a successful esthetic management of a complicated crown fracture with fibre reinforced composite post. This technique allows immediate core build up with composite, reduces the number of appointment and minimal laboratory procedures.

Fibre posts are a better option than the metallic posts and have a less likelihood of root fractures. A thorough understanding of the different post systems and the choice of the adhesive systems and the core materials are important in achieving long term clinical success.

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