



Bundled Glass Fiber Reinforced Composite Post A New Trend In Restoring Endodontically Treated Teeth: A Case Report

Dr Anil K.Tomer¹, Dr Kanika², Dr Sachin Poonia³, Dr Ayushi Khandelwal⁴, Dr Kripa Krishnakumar⁵

¹Professor and Head, ^{2,5}Postgraduate Student

Department of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Uttar Pradesh.

***Corresponding Author:**

Dr Kanika

Postgraduate Student, Department of Conservative Dentistry and Endodontics, Divya Jyoti College of Dental Sciences and Research, Modinagar, Uttar Pradesh.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Teeth having extensive tooth structure loss either due to trauma or tooth decay which have undergone root canal treatment have to be restored for their esthetic and functional rehabilitation. Clinical case – in the present report 25-year-old male patient reported with fractured tooth due to trauma which is endodontically treated and now in need of an esthetic rehabilitation. On radiographic examination root canal treated 21 was found. Treatment comprises of removal of gutta percha to make post space followed by post and core and all ceramic crown placement.

Keywords: bundled post, fiber post, esthetic rehabilitation

INTRODUCTION

Achievement of structurally sound and esthetically pleasing reconstructions in cases of root canal treated teeth is difficult especially when there is moderate to severe tooth loss. In such cases post and core offers promising results in terms of retention, strength as well as esthetics.

If only a ferrule of minimal thickness can be achieved from remaining coronal tooth structure, a post and core build up following endodontic treatment could be of great assistance for retaining and supporting the future restoration [1].

For many years customised cast metal post and core remained standard for restoration of such teeth. The technological evolution has enabled manufacturers today to provide fiber post that besides offering superior esthetic and mechanical properties are also radiopaque and available in great sizes [2].

Earlier, rigid metal posts resisted lateral forces without distortion and this resulted in stress transfer to the less rigid dentine causing potential root cracks and fracture. The fiber post have similar physical properties as that of dentin. As their modulus of elasticity is close to that of dentin therefore, they flex under load and as a result of which the stress is distributed between post and dentin homogenously. Thus, improving the resistance to fracture and ultimately the overall prognosis of the tooth [3].

Currently available fibre-based posts are essentially composite materials. They are composed of fibres of carbon, quartz or silica surrounded by a matrix of polymer resin, usually an epoxy resin.

The bundled glass fiber reinforced composite post used in present study is based on the concept that there is no additional tooth substance needs to be sacrificed so there is no further weakening of the tooth structure. It consists of a bundle of fine

individual posts (0.3 mm in diameter) in varying numbers. Once the sleeve is removed, the bundle is spread, and the fine individual posts are distributed in the entire root canal. The post adapts to any root canal morphology. Also, the material translucency increases esthetics.

By this perspective, the aim of this case report was to report a clinical case of fractured root canal treated maxillary left central incisor which was treated using a bundled glass fiber reinforced composite post followed by core build up and all ceramic crown.

CASE REPORT:

A 25-year-old male patient reported in post graduate clinic of the Department of Conservative Dentistry and Endodontics of our institute with a chief complaint of fractured tooth in upper front tooth region for which he had undergone RCT few months back and now wants the esthetic rehabilitation for the same.

A clinical examination revealed fractured maxillary left central incisor (tooth #21) with no evidence of tenderness or swelling. (Fig.1)

All ceramic crown was cemented and patient was recalled after one and three months for follow up. (Fig.4)

On radiographic examination of tooth in question, root canal treated 21 was there.

CLINICAL PROCEDURE:

After complete clinical and radiographic assessment of tooth in question, 2/3rd of the gutta percha was removed from the canal using peso reamer in order to create post space maintaining the 4-5 mm apical seal. (Fig.2) After the creation of post space, the canal was disinfected (alcohol) and dried (paper points). Post (voco Rebilda GT) of appropriate size was selected. The length of the post was determined and confirmed using a radiograph. Bonding of canal as well as the post was done by coating the canal and post using self-etch dual cure adhesive cement (Rely X). Post was then inserted into the canal and the sleeve was removed. The bundled fibers were spread using a spreader (fig.3) and the post was light cured. Extra length was cut using high speed airtor without water followed by the core build up which was established with the successive addition of composite resin.



Fig1. PREOPERATIVE CLINICAL PICTURE



FIG 2. POST SPACE

**Fig3. POST INSERTION****FIG 4. CROWN PLACED**

DISCUSSION

With the continuous ongoing evolution in the field of posts in terms of materials, shape etc. today we have a wide variety to choose from. After the introduction of fiber post in early 19s their popularity has increased among practitioners. The clinical success rate of these post systems has been evaluated through longitudinal studies. Fiber posts are preferred in cases where a metal post can jeopardise the aesthetic results. Also, for the at-risk patients with a history of traumatic injuries, in which the insertion of a metal post will put an endodontically treated tooth at risk of root fracture as the fracture resistance of fiber posts are higher than that of metal posts because fiber post have similar physical properties to that of dentin especially in terms of modulus of elasticity.

Glass fiber posts are one of the recent developments and show many added advantages over the conventional post systems in terms of physical properties, esthetic factor, risk of root and restoration fracture, adhesion to the core, radiopacity, biocompatibility, chemical stability and many other aspects. The use of self-adhesive resin cement could further improve the retention as well as the physical properties of glass fiber posts into root canals [4]. This eventually results in increasing the longevity of the endodontically treated tooth.

The main problem encountered while using prefabricated post system is compromising the remaining root dentin thickness in order to make post space to fit the post into the root canal. Hence compromising the strength of the tooth. Eric et. al. in his in vitro study concluded that, intracanal preparation up to number 5.0 drill increased the risk

of perforation or weakening of the root in the buccal and palatal aspects, especially at the apical level [5].

Torbjorner et. al. reported, based on 4-5 years of postoperative clinical assessment, that retention loss is the major reason of post failure, and that the maxillary teeth show more failure than those of the mandible, especially the maxillary incisors [6].

Use of bundled post system gives this added advantage over the pre-fabricated one as they adapt to the canal morphology therefore minimising the loss of residual dentin thickness that had to be sacrificed in order to obtain the perfect fit leading to conservative root preparation for the post.

In a study by Hedge et. al. on comparing bundled glass fiber post with unpolymerized and pre-polymerised post systems found that the bundled glass fiber post showed more resistance against vertical as well as oblique loads [7]. The bundled post can be used to strengthen the weakened tooth especially in cases of large canal spaces as, with the spread of individual fibers it can occupy the canal space well adapting to the canal morphology with least cement thickness leading to strengthening the canal. This can also be ascribed as better stress distribution is there due to better chemical bonding between glass fiber and resin matrix. Also, better bonding to core and adaptation to the canal walls due to increased number of fibers. These altogether results in increased strength.

CONCLUSION:

A bundled glass fiber post is a quick and easy option as it adapts to the canal morphology hence allows preservation of the tooth substance as there is no need

for preparation of the post site to fit to the size of post which can weaken the tooth.

REFERENCES:

1. Aashwini Lamichhane, Chun Xu, Fu-qiang Zhang. Dental fiber-post resin base material: a review. *J Adv Prosthodont* 2014;6:60-5.
2. Simoni Grandini, Serina Sapio, Marco Simonetti. Use of anatomic post and core for reconstructing endodontically treated teeth: a case report. *J Adhes Dent* 2003;5:243-47.
3. G. Bateman, D. N. J. Ricketts and W. P. Saunders. Fibre-based post systems: a review. *British Dental Journal* 2003; 195: 43–8.
4. R Sarkis-Onofre, JA Skupien, MS Cenci RR de Moraes, T Pereira-Cenci. The Role of Resin Cement on Bond Strength of Glass-fiber Posts

In the present case the patient is on further follow ups. We have planned further follow up at 6 and 12 months.

- (GFPs) Luted Into Root Canals: A Systematic Review and Meta analysis of In Vitro Studies. *Operative Dentistry* · August 2013.
5. Eric et al. The impact of post preparation on the residual dentin thickness of maxillary molars. *J Prosthet Dent* 2011;184-90.
6. Torbjorner et al. Survival rate and failure characteristics for two post designs. *J Prosthet Dent* 1995;439-44.
7. Vibha Hegde, Nikita Arora. Fracture Resistance of Endodontically Treated Teeth Restored Using Three Different Esthetic Post Systems. *J Operative Dent and Endod.* Volume 4 Issue 1 (January–June 2019).