



Use Of Ribbond Fibre For Rehabilitation Of Endodontically Treated Teeth: A Case Report

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Abstract

A clinical case was done using ribbond, a new type of post material, together with dual curing resin cement so that fractured teeth is reconstructed after endodontic treatment. After post space preparation canal is prepared for bonding. A dual-polymerizing dentin-bonding agent will be applied to the canal and then cured. A highly filled, dual-polymerizing hybrid resin is then injected into the canal space. Ribbond is then placed into the canal, cured and core built up was done. Anterior teeth were reconstructed into normal shape of tooth and then polished. Polyethylene fiber post and composite materials could be a good choice of treatment in traumatized anterior teeth, with excellent esthetic and functional results.

Keywords: Ribbond, Polyethylene fiber post, Composite, Endodontic treatment

Introduction

Root canal therapy preserves the tooth, whereas restoration restores it to its former status as a main contributing factor of the masticatory system. When a tooth requires endodontic treatment, it is frequently badly harmed by decay, excessive wear, or prior restorations, leaving little coronal tooth structure. Due to this loss, unique restoration methods are required since it makes it difficult to retain later repair and raises the risk of fracture during function. The retention of the final restoration becomes problematic when there is less tooth structure left, so additional retentive elements in the form of posts must be provided to improve retention. Due to past disease, endodontic therapy, and/or restorative operations, an endodontically treated tooth has coronal and radicular tissue loss; posts are frequently required to ensure adequate retention for the core material.

The introduction of fiber posts has a great impact on the clinical procedures on restoring endodontically treated teeth. There has been continuous research on these products to modify the type of fibers from (carbon to quartz to glass) as well as the shape of the posts. A woven polyester bondable ribbon-based fibre composite laminate endodontic post and core system had been introduced. This reinforcement material is made of triaxial braid or leno wave-shaped ultra-high molecular weight polyethylene fibres that have been plasma treated. Higher mechanical interlocking is offered because to unique cross-linked thread patterning. In order to ensure a strong chemical bond with resin materials, cold gas plasma pretreatment also reduces the fiber's superficial tension. It has been demonstrated that polyethylene-reinforced resin offers the appropriate retention necessary for a post and core system to succeed clinically, as well as strong fracture resistance with an increased incidence of fractures

that can be repaired in structurally challenged canals. Despite the great qualities displayed by these posts, the high cost of polyethylene fibres prevents their usage in everyday practice.

Ribbon is a biocompatible, bondable, aesthetic, translucent and easy-to-use reinforced ribbon. By virtue of its wide spectrum of intended properties, it enjoys various applications in clinical dentistry. Ribbon can be used in stabilizing traumatized teeth, in restoring fractured teeth and in creating a fixed partial denture, for direct-bonded endodontic posts and cores, orthodontic fixed lingual retainers and space maintainers.

Case Report

A forty-year-old patient came to the department of conservative and endodontics with the chief complaint of fractured teeth. The patient gives history trauma six months back. In the intra oral examination it was revealed that the trauma caused a complicated crown fracture with extensive pulp exposure on teeth 11,12 and 21. Extraoral examination revealed no signs in soft tissues. Radiological examination revealed periapical pathology. After clinical and radiographic examination, the decision was made to endodontically treat teeth 11, 12 and 21, and to restore all the teeth with resin composites until prosthetic treatment could be performed. Before treatment, patient was informed about the treatment

process. After the informed consent, the treatment was started.

After local anesthesia with adrenaline 1:80000 and proper isolation with rubber dam access opening was done for the three teeth. It was then followed by biomechanical preparation and obturation with gutta percha. Temporary restoration was given and patient was recalled for post placement. During next appointment, treatment started after ensuring that there is no pain on endodontically treated teeth. The root canal treated teeth was prepared in the standard clinical manner with gates glidden drill. The canal was then prepared for bonding. A dual-polymerizing dentin-bonding agent will be applied to the canal and chamber surfaces and thinned with a brush. After the width of the reinforced polyethylene fibre is determined, the prepared dowel space is measured twice with a periodontal probe to determine the length of fibre needed. A highly filled, dual-polymerizing hybrid resin is then injected into the canal space. With the help of probe and tweezers ribbon was carried through the luting resin into the canal till the apical end of the canal. It was then cured with curing light. Composite was then applied to the protruding ends of ribbon into the shape of a core and cured. Suitable shades of Ivoclar Te Econom Plus was selected and built up. It was then cured, shaped and polished. Patient was instructed to come for further follow up.

Fig 1: Preoperative photograph



Fig 2: After endodontic treatment post space prepared



Fig 3: Ribbond placed as post inside the canal



Fig 4: Radiographic image after post placement



Fig 5: Core built up done with composite



Fig 6 : After final shaping and polishing



Discussion

Earlier posts were typically constructed in stainless steel, titanium, or precious alloy, or cast in a precious alloy. They failed to account for the unique shape of each root canal, which made their adaption less than ideal. A post core system should have parts with various degrees of stiffness. Stress would be transferred to the less rigid substrate since the more rigid component can withstand forces without distorting. Therefore, the root structures may be under stress from the disparity between the elastic modulus of dentin and that of the post material.

Ribbond and composite resin are both used together. The material's physical characteristics enable the conservative manufacturing of esthetic dowels and core foundations. As a result, an elegant post core system that individually responds to the root morphology is created. The laminate resin post structure experiences very little cracking due to the

fibres' natural ability to stop cracks. According to reports, the relative flexibility of the fibre composite laminate post reduces root microcrack propagation.

In this case, direct restoration on an individual post can be completed in a single visit without the need for laboratory assistance. The traditional post and core system, whether direct or indirect, calls for a minimum of two visits as well as a laboratory phase. In a situation like the one mentioned, when the patient can be called in for treatment to be completed in a few visits with each one being as quick and simple as possible, this new procedure is especially useful. In addition, it is feasible to quickly build up and construct a resin composite core on the anatomic post if a prosthetic restoration is intended for the endodontically treated tooth.

Woodpecker et al. have used the polyethylene fiber post for central incisor tooth restoration with coronal

damage and have stated in 5-year follow-up that the restoration was successful and there was an improvement in periapical tissues. Esin Özlek and Gizem Kadi used a polyethylene fiber post to adhere the coronal part to the root and reduce occurred stresses. It has been reported that the polyethylene fiber post they used provides a way to distribute stress among incoming forces, and also acts as a rigid band to prevent the opening of the fracture and deformation in pre-fractured surface.

Rocha ROD used ribbon as intracanal reinforcement fiber in pediatric dentistry. The use of fibers as intracanal retainers associated to performed resin composites is presented as an alternative option for the reconstruction of primary incisors greatly damaged by extensive carious lesions, in view of their ability to reinforce a great volume of resin composite with adequate translucency and relatively easy manipulation. Ayna B et al compared the clinical efficacy ribbon with composite restorations and concluded that it retains resin composite restoration. According to Khurana et al ribbon have a lower fracture resistance than everstick post.

Conclusion

There have been significant developments in post systems in recent years with respect to post and core construction materials, post shape and design, bonding systems and techniques for removal. One advantage of fiber reinforced systems is that the modulus of elasticity of the post is similar to tooth tissue; hence, post failure should occur before root fracture under conditions of stress. The flexural

strength of fiber posts was found to be similar to metal posts as long as contact with water was avoided. Fiber posts have an excellent translucency so they are preferred if anterior esthetic restoration is needed. In conclusion, polyethylene fiber post and composite materials could be a good choice of treatment in traumatized anterior teeth, with excellent esthetic and functional results.

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