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ORIGINAL ARTICLE

Simplifying Direct Pattern Technique using Fiber Post

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ABSTRACT

Direct intraoral fabrication of cast post and core restorations for endodontically treated teeth can be challenging and time consuming. In addition, accurate intraoral fabrication of resin patterns with intracervicular margins is not always possible as a result of restricted access and difficult isolation.

This article presents a direct–indirect method that uses different diameters of prefabricated posts as fiber post and polyvinyl siloxane material as a mold for fabrication of multiple post patterns.

Keywords: Cast post, Direct–indirect pattern, Fiber post, Intraradicular restoration, Restoration of endodontically treated teeth.

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INTRODUCTION

Teeth requiring endodontic treatment commonly have lost an extensive amount of remaining coronal tooth structure that often necessitates the use of an intraradicular post to retain the coronal restoration. In the past, some researchers believed that posts strengthen endodontically treated tooth; nowadays, it is well known that preparation of a post space may increase the risks of root fracture.[1,2]

Cast post and core restorations have been the most commonly used since its introduction. Although prefabricated fiber-reinforced post has become more popular for clinical application because of its improved esthetics and saving time as well as having a similar elastic modulus of dentin, cast post and core system showed a higher survival rate.[3-7]

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In some cases, irregular geometry of root canal system of the abutment tooth may not be suitable for a prefabricated post and core, especially when elliptical and excessively flared ovoid root canals are present or the remaining dentin is inadequate to securely bond or retain the core material.[8] However, these cases are best treated with a custom cast post and core. Moreover, using a cast post and core in esthetically compromised cases is recommended by allowing changes in position of the clinical crown in order to improve function and esthetics of the final restoration.[9]

Different materials have been advocated for fabrication of cast post and core restorations, including the use of unfilled bisphenol-A glyceril methacrylate composite resin,[10] light-cured acrylic resin,[11] and thermoplastic materials,[12] along with different techniques using bead and flow,[13] Heilman[14] suggested the use of a needle to inject the resin to the depth of the prepared canal.

Various problems associated with fabrication of direct custom cast posts include the inability to accurately control the monomer polymer ratio, thus requiring the application of multiple layers of acrylic resin. The pattern may contain a partially cured resin or voids, leading to possible distortion, other problems are locking of the pattern into undercuts of the root canal and resin fracture during removal of the pattern.[12]

Direct intraoral fabrication of cast post and core restorations for multiple endodontically treated teeth can be challenging and time consuming. In addition, accurate intraoral fabrication of resin patterns with intracervicular margins is not always possible when restricted access and difficult isolation are present.

This method demonstrates a direct–indirect technique that uses different diameters of prefabricated posts as fiber post and polyvinyl siloxane material as a mold for fabrication of multiple post patterns.

TECHNIQUE

Tooth Preparation

- In the patient's mouth as a start post space preparation is created with a suitable non-cutting end peeso reamer (Endotec Inc., Mani Instruments, Helifax, NS) to within 4 to 6 mm from the apex.
- Use a suitable size of tapered fiber post drill to create a tapered post space preparation.
- Select the matching fiber post to the drill used (Fig. 1).

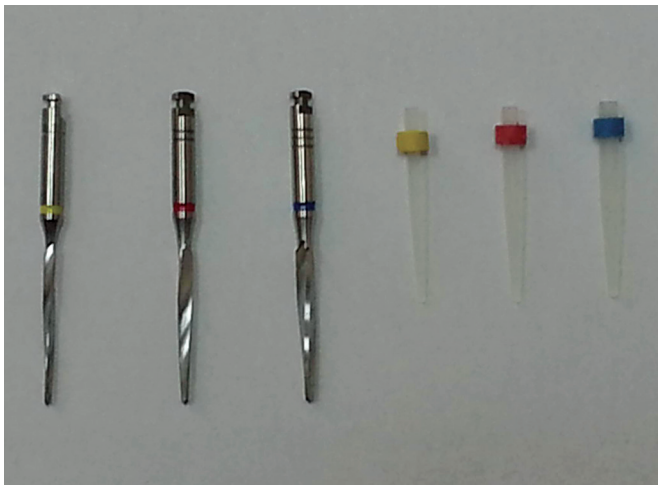

Fig. 1: Prefabricated posts that match the drills

Fig. 2: Mold fabrication using fiber posts

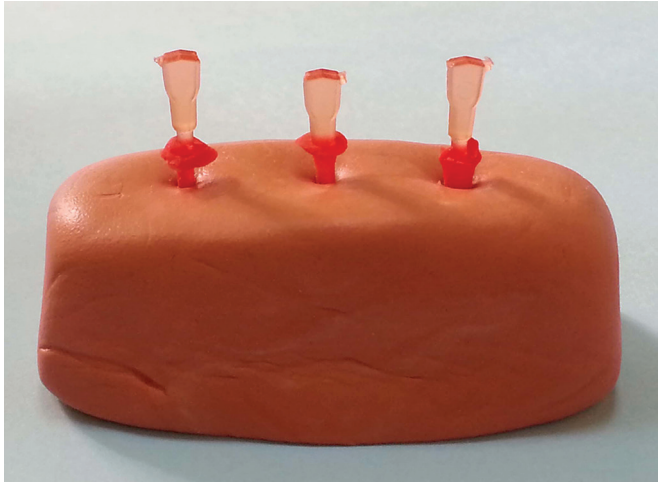

Fig. 3: Post pattern fabrication using the mold

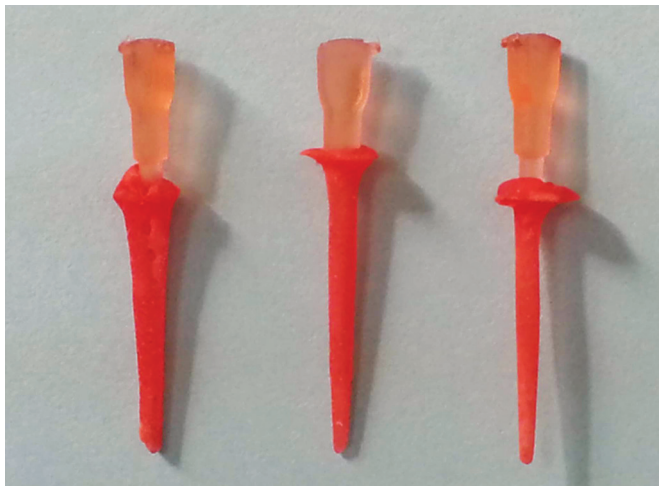

Fig. 4: Indirect prefabricated post resin pattern

- Mix the putty polyvinyl siloxane impression material to create the mold.
- Insert the selected fiber post into the putty to create the mold, which is going to be used for making the preformed resin pattern post and core (Fig. 2).
- Put a light consistency mix of autopolymerized resin into the mold, then a monomer moistened plastic post should be inserted to produce a preformed post (Fig. 3).
- After the material polymerizes, remove and trim if necessary (Fig. 4).
- Customize and finalize the produced custom-made preformed post by applying autopolymerized resin on it by using brush bead technique and place it into the root canal in and out few times to be fitted easily in the prepared post space.
- Fabricate the core with a suitable polycarbonate or celluloid crown painted internally with Vaseline.
- Custom-made cast post and core is ready to be invested and casted (Fig. 5).

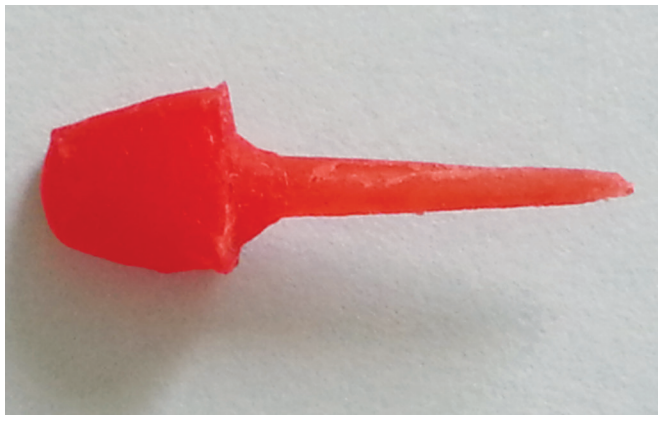

Fig. 5: Castable indirect–direct pattern post and core

RESULTS

Post adjustment was minimal especially if the suitable post space drill is used. However, a small amount of resin addition may be necessary to adjust the post pattern directly intraorally to be fitted into the morphology of the root canal space.

DISCUSSION

Regardless of the popularity of prefabricated fiber-reinforced post that bonds and flexes with the tooth structure, easier to remove if retreatment is required, and has no adverse effects on esthetics, but one of the most critical factors that compromise the long-term prognosis of endodontically treated teeth is the residual interradicular structure.[8]

In many cases, where noncircular root canal exists, it must be enlarged to fit the configuration of the selected prefabricated post, subsequently sacrificing additional root canal structure to achieve optimal adaptation.[15] Therefore, prefabricated posts have optimal adaptation and function in teeth with small circular canals.[16] However, most root canals have irregularly flared canals and the prefabricated post systems are contraindicated due to improper adaptation and the required thickness of the resin cement is increased affecting the final retention.[15]

The conventional custom cast post and core provides a superior anatomical adaptation to excessively flared or elliptical canals and mostly requires minimum tooth structure removal.

CONCLUSION

Selection between custom and prefabricated post has been an issue for the clinician. However, with a variety of post and core systems available in the market, no single post and core system provides the perfect restorative solution for every clinical condition, and each situation requires an individual endodontic restorative evaluation.

CLINICAL SIGNIFICANCE

This method facilitates the production of resin pattern preformed post and core at the chair side easily and precisely with the avoidance of mishaps, such as engaged and fractured resin pattern post inside the root canal. This method can be used to produce any shape of drills and posts.

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