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CASE REPORT

A Systematic Approach to Restore Grossly Decayed Multirooted Teeth: Split Cast Post and Core

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ABSTRACT

Endodontically treated molars with almost total coronal destruction may be salvageable by using multiple posts in divergent canals. The fabrication of dowel and core for multirooted teeth can be a vexing problem, especially when there is minimal coronal dentin. A number of methods have been suggested for making a cast dowel and core using two or more of the canals to increase retention of the prosthesis. This article presents a clinical report on fabrication of split cast post and core by a direct technique that is efficient and enables the dentist to use the maximum length available in each canal, despite the degree of divergence in multirooted teeth.

Keywords: Divergent root canal, Direct technique, Multirooted teeth, Split cast post and core.

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INTRODUCTION

Restoring grossly decayed multirooted teeth has always been challenging for any dentist and the laboratory technicians. Endodontist has to ensure the clinical success of endodontic procedures and the prosthodontist has to ensure the long-term durability and esthetics of the restoration. Cast post and cores provide retention and resistance to the already weakened tooth structure.

Rebuilding abutment teeth with the metal casting has been widely applied for a long time and has a good reputation clinically for grossly decayed teeth. This method brings difficulties when applied for the divergent and multi-rooted teeth. The split method has been used for the divergent and multirooted teeth, since it is difficult to insert the one piece casting dowel-core into the nonparallel root canals.

The fitting of cast post and core restorations is critical to ensure good adaptation and passivity of fit.[1-3] If a passive fit is not achieved, wedging stresses may result in root fracture.[4] In the case of multiple posts, parallelism of posts are required for seating of the restoration; but in cases where the roots are divergent split post and core are fabricated to achieve proper seating of the restoration. This article presents split cast post and core technique to restore grossly decayed mandibular second molar abutment for fixed partial denture.

CASE REPORT

A 25-year-old male patient reported with complaint of a missing left back tooth. On clinical examination revealed missing left mandibular first molar, grossly decayed mandibular left second molar and carious mandibular third molars. Radiographic examination revealed normal gingival and periodontal status.

Treatment Plan

A thorough clinical evaluation of the occlusion was done. Alginate impressions (Zelgan 2002, Dentsply, India) were made for making the diagnostic casts. The treatment plan included complete oral prophylaxis and maintenance protocol, root canal treatment of the left mandibular second molar followed by fabrication of split cast post and core and restoration of the carious teeth.

Procedure

After 3-month follow-up of endodontic treatment, gutta-percha was removed from the pulp chamber and canals, leaving 4 mm in the apical portion of the distal canal. The canal was shaped with Peeso reamers (Dentsply, India). Weakened and unsupported tooth structure was removed. The custom-made acrylic resin post was inserted into the distal canal up to the calculated length. It should snugly fit into the canal. Root canal surface was coated with a suitable lubricant. An autopolymerized resin was applied on the custom-made acrylic post using brush bead technique and replaced into the distal canal. When the material is in dough stage, slowly withdraw the post and then again seat it into the place to prevent binding of acrylic resin into the root canal. Auxiliary post was fabricated using the same technique.

The primary post was lubricated with petroleum jelly. With the mesial post in place, Duralay resin was used to build up the core. Once the material is set primary post (distal canal) was removed first and then the auxiliary post (mesial canal) with core (Fig. 1). A high heat investment (Biovest, Dentsply International, York, PA) that flows easily was used for casting. Auxiliary dowel with core was fitted in the tooth and split post (distal canal) was secured in its channel (Fig. 2). Radiograph of the post and core restoration was taken to confirm its proper seating (Fig. 3).

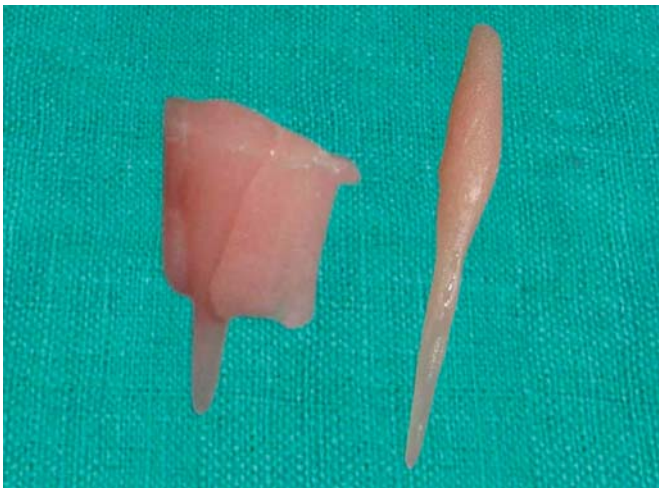

Fig. 1: Acrylic auxiliary post with core and primary post

Fig. 2: Auxiliary post with core and primary post after casting

Fig. 3: Radiograph view of restoration

Tooth was cleaned and dried. First, the auxiliary dowel and core was cemented, and then the primary dowel. After the cement has set, primary dowel was cut flushing with the occlusal surface (Fig. 4). Two impressions were made; an alginate impression to prepare a temporary crown and another with hydrophilic polyvinyl siloxane impression material (dual mix) to prepare the metal-ceramic crown.

Fig. 4: Dowel flushing with the occlusal surface

DISCUSSION

A post-and-core assembly is placed in a badly broken-down tooth to restore the bulk of the coronal portion of the tooth to facilitate the subsequent restoration of the tooth by means of an indirect extracoronal restoration. Hitherto, dental cement, dental amalgam, metal casting and the combined method with the ready-made post and composite resin have been applied generally for the rebuilding of abutment teeth.

The literature describes numerous techniques for fabricating the cast post and core.[5] Failure of these systems include loss of retention of posts and fracture of the root or root perforation. The present technique described in the article is effective for extensively damaged teeth that lack sufficient tooth structure to create an adequate ferrule of 1.5 to 2 mm for the final crown. The ultimate success of cast post and core depends largely on the level of education and motivation that the patient has gone through. At the 1-year clinical follow-up, the prosthesis exhibited no evidence of failure and the patient was satisfied with its function and esthetic.

CONCLUSION

The fabrication of dowels and cores for multirooted teeth can be a vexing problem, especially when there is minimal coronal dentin. This article describes a direct technique that is efficient and enables the dentist to use the maximum length available in each canal, despite the degree of divergence of the canals in multirooted teeth.

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