

Split Post and Core: A systematic approach to restore grossly decayed teeth

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ABSTRACT

A grossly decayed tooth sometime poses difficulty in fabrication of FDP, The post core is often required to gain support from the remaining tooth structure, In a multirooted tooth where more than one root were used as support the path of insertion of post is difficult, in those cases a custom split post and core has to be fabricated. This case report describes a simple and scientific multidisciplinary approach towards management of grossly decayed tooth. The technique seems to be 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.

Key words: Split post-core, metal try-in, porcelain try-in

Introduction

Restoring grossly decayed teeth are always challenging for any endodontist, prosthodontist, periodontist and the laboratory technicians, especially in case of multirooted teeth. 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 have multiple advantages, especially

the retention and resistance they provide and strength they impart to the already weakened tooth structure.

Cast post with cores should not bind within the root canal. The fitting of cast post-and-core restorations is critical to ensure good adaptation and passivity of fit. [1, 2, 3] If a passive fit is not achieved, wedging stresses may result in root fracture [4] and in case of multiple posts the

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 describes a procedure to restore a mandibular molar with split post and core, and a fixed partial denture in relation to missing mandibular first molar.

Case Report

A male patient in his early twenties complained of missing and multiple decayed teeth. Patient had got his tooth extracted about one year back. Medical history was non significant. Clinical examination revealed grossly decayed mandibular second molar, decayed left and right mandibular third molars. First molar of both sides were missing and the right side first molar was replaced with fixed partial denture. Radiographic examination revealed normal periodontal status. Oral hygiene index was poor.

A thorough clinical evaluation of occlusion was done. Alginate impressions were made for pouring diagnostic casts. All necessary records were taken for a diagnostic mounting on a semi – adjustable articulator. A comprehensive treatment plan was formulated including endodontist and prosthodontist. The treatment plan included complete oral prophylaxis and maintenance protocol, root canal treatment of the affected teeth, restoration of the carious teeth. Mandibular left second molar required a cast post core, second premolar would serve a mesial abutment for a three unit fixed partial denture in relation to missing left first molar. The following

treatments were carried out in the coming few visits:

1. Oral prophylaxis following which patient was educated and motivated to maintain her oral hygiene.
2. Restorative treatment included silver amalgam filling of the posterior teeth that were involved with proximal and occlusal caries.
3. An endodontist from the endodontics clinic performed root canal therapy in relation to mandibular second molar. The endodontist used lateral compaction technique to fill the root canals to the level of the canal orifices. After three months of necessary endodontic follow up Prosthodontic treatment was carried out.

PREPARATION OF THE RADICULAR AND CORONAL PORTION

The gutta-percha was removed from the pulp chamber, leaving 4 millimeters of gutta-percha in the apical portion of the canal, the distal canal served as a primary canal and mesiobuccal canal served as a auxiliary canal for post retention. The canal was shaped with Peeso reamers (dentsply.) to a final diameter of 1.25 mm and a depth of 8 mm from the prepared coronal surface. The acrylic post which was custom made in the lab was inserted into the distal canal upto the calculated length, it should snugly fit into the canal. After coating of distal canal with petrolatum gel, add self cure resin on the custom acrylic post by brush bead technique, insert the post into the canal while the material is in dough stage. Afterward with the same technique we fabricate the accessory post.

We then trimmed the unsupported tooth structure and adapt a resin pattern to the pulp chamber which serves as core that can

be joined to either of the posts; in our case we had joined the core with the accessory post. The primary post was then seated into the final position through the hole drilled into the core. (Fig. 1, 2) This procedure result in a split type of post & core and can be used in multirooted tooth. Simultaneously we also prepare abutments as the retainer for the FDP. The patient was then discharged after cementation of temporary bridge. The dental technician invested the post-and-core pattern and cast it in base metal alloy. (Fig. 2)



Fig. 1 Acrylic primary & auxiliary post with core



Fig. 2 Acrylic primary & auxiliary post with core after casting

On next visit we try cast post and core for satisfactory fit, after achieving satisfactory fit of the restoration, (Fig. 3)



Fig. 3 Intra oral view of primary post in its channel

We used a no. 40 Lentulo spiral filler (Dentsply Maillefer, Ballaigues, Switzerland) to introduce the cement into the canal space. We coated the post-and-core assembly with cement and seated it slowly by using finger pressure maintained for eight minutes. We then removed the excess cement. (Fig. 4)



Fig. 4 Primary dowel flushing with the occlusal surface

After cementation two impressions were made. An alginate impression to prepare a temporary and another with elastomer (dual mix) to prepare the crown.

On next appointment we prepared the wax pattern as a full-cast crown on the second molar core, a porcelain-fused-to-metal (PFM) retainer on the second premolar and

a PFM pontic for the first molar. Before clinical insertion, we seated the metal framework on the stone die Metal try in of the three unit fixed partial denture and appropriate shade was selected.

On subsequent visit we fused the porcelain to the metal framework and, after the trial seating, a dental technician glazed the three-unit FPD in the laboratory. Cement (RelyX ARC Adhesive Resin Cement, 3M ESPE) was used for final cementation three-unit FPD onto the abutments. (Fig. 5)



Fig. 5 Post operative view

Patient was given instructions regarding esthetics, maintenance, care and mastication with the fixed partial dentures. Patient was put on a regular follow up. Patient did not report any problem with the treatment prosthesis and was highly satisfied.

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. [5, 6, 7] The literature describes

numerous techniques for fabricating the cast post and core. [8, 9] Failures of these systems include loss of retention of posts and fracture of the root or root perforation. The ultimate success of cast post and core depends largely on the level of education and motivation that the patient has gone through. Patient was demonstrated through visual means the prognosis of the treatment; he was recalled every month initially. After doing the root canal treatment, it is necessary to determine that the endodontic treatment was successful for which 3 months are advised. As the patient had no symptoms in relation to grossly decayed teeth, therefore this time period was reduced to one month. The endodontist decided the time to start Prosthodontic rehabilitation.

Fabrication of wax pattern for the crown was done using the patient's protrusive records. It was ensured that porcelain – metal junction for labial facing did not counter centric stop, this prevents the failure of labial facing. During metal trial of the post core adequate clearance was given to provide space for metal. The preparation of the root canal was done so that as maximum length of the root was covered. The technique described above seems to be 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. When insufficient tooth structure exists to prepare a tooth for coronal coverage, the clinician must use a technique that restores lost dentin. Lengthening the clinical crown by removing supporting alveolar bone to expose more sound tooth structure may be

effective but it may lead to change in crown root ration.

Achieving internal reinforcement by posts to the residual root provides retention and adds stability to the prosthesis. At the one-year clinical examination, the prosthesis exhibited no evidence of failure and the patient was satisfied with its function and esthetics.

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