

“Custom made cast post core on a mandibular molar using direct approach”

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ABSTRACT

Custom made cast post core provide flexibility in restoring grossly decayed tooth, since they are retained from the root canal. The fabrication of a pattern for a cast post core can be made either directly in the patient's mouth or indirectly on the working cast. When done directly in the patient's mouth, one has to innovate in order to fabricate two different patterns that are decided by the angulation of the roots. We present a direct technique of fabricating a pattern using duralay resin in two different canals of mandibular right first molar. The technique is simple and bring effective results. The technique is based on making one pattern directly in line with major root canal and the other pattern as part of the core that has a root extension.

Keywords — dowel, core, base metal alloy, porcelain fused to metal, duralay resin.

INTRODUCTION

Metal posts (tenons) were first used in 1728 by Pierre Fauchard. He screwed posts into the roots of the teeth to retain bridges. ¹ Since then the use of post and core has continuously grown in terms of techniques and materials used. The use of cast post core was brought into dentistry in the year 1930 when it replaced the one piece post crowns. ² Cast post core is a restorative option that allows a clinician to even customize the angulation of the core within the prepared canal. ³ At the same time, clinical judgement is essential to balance between an esthetic restoration and normal occlusion. ⁴ This applies especially when molar teeth are restored with cast post cores, especially when divergent canals are present. The problems of accessibility and visibility are always associated with restorations done in the posterior region of the oral cavity. Cast post core for mandibular molars can be performed with two different techniques, direct and indirect pattern fabrication. ^{5,6} A post core restoration involves a multidisciplinary approach since an endodontist must ensure clinical success of root canal treatment, while a prosthodontist ensures durability and esthetics of restoration. ⁷

While fabricating a custom cast post core using an indirect approach has many advantages, this article focuses on fabrication of a cast post core in a mandibular molar using a direct approach. Difficulties

and complications that occur during the procedure have also been discussed.

CASE REPORT

A young male patient aged 28 years was referred from the department of Endodontics to undergo a crown for an endodontically treated mandibular right second premolar and first molar. Patients medical and social history were non contributory to the existing treatment plan. The patient had developed carious lesions in relation to the first molar following which he had developed a periapical abscess which prompted him to seek dental treatment. Extra oral and intra oral examination showed normal features. The mandibular right first molar was grossly decayed with three walls intact, although the walls were thin. A treatment plan that was decided in the case was to use a custom made cast post core followed by a porcelain fused to metal crown for second premolar and first molar. The patient consented to the treatment plan. For the mandibular molar, the treatment was initiated by the removal of the temporary restoration from within the access cavity as prepared during endodontic treatment till the underlying gutta percha was exposed. This was followed by removal of gutta percha from two root canals (mesio buccal and distal) using a gate Glidden drills of varying sizes. The root canals were then prepared using Pecho reamers of varying sizes starting from smaller diameter to consecutive larger diameter.

Once the post space was prepared, a ferrule preparation was done that would support the core of the prepared tooth. Duralay resin was mixed and placed within the root canal to form a pattern that would fit the root canal. Another layer of duralay resin was placed within the inside of the crown and had an extension into the smaller root (**Fig 1 A**). The first pattern was then fitted into the second pattern with a layer of separating media preventing their adhesion (**Fig 1 B**). The two components of direct pattern were then observed for fit extraorally (**Fig 1 C**). Patterns prepared were then individually cast in a base metal alloy (Nickel chrome) and the two were finished and polished using regular laboratory procedures (**Fig 1 D**). Both cast components of the cast post core were evaluated for fitness within each other without binding (**Fig 1 E**). A radiograph was taken before cementation of the components. The two components were then permanently cemented using zinc phosphate cement.

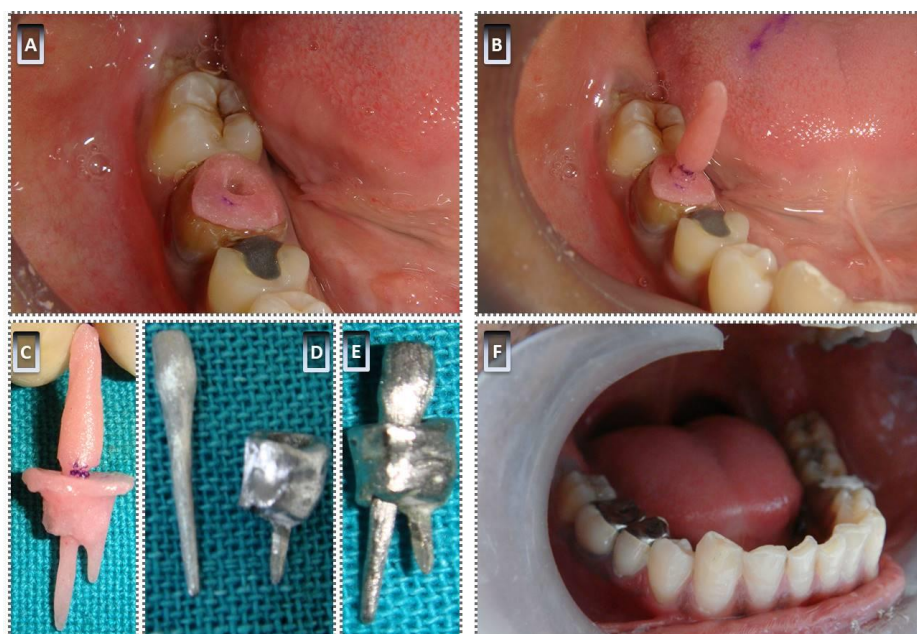


Figure 1: (A) Direct pattern with an opening for a divergent root post (B) Divergent post placed through the opening (C) The two custom post core fitting into each other (D) Individual cast post core (E) Combined cast post core (F) Metal ceramic crowns with buccal facing

Regular clinical procedures were followed for fabrication of a metal, ceramic crown restoration for mandibular right second premolar and first molar. The two crowns were finally cemented using zinc phosphate cement. The patient was put on a regular follow up for a period of one year. During his visits at follow up, he was highly satisfied with the outcome of treatment.

DISCUSSION

A technique that utilizes a direct approach for fabricating a cast post core pattern in a mandibular molar with divergent canals has been described. With cast post cores, one has the added advantage of changing morphology of the crown restoration that is independent of root canal inclination.⁸ This advantage mainly overlooks its disadvantages like loss of post retention,⁹ root fractures or risk of corrosion.¹⁰ One of the major problems while working in the posterior region of the mandible is the accessibility and visibility of the root canal orifice, which are compounded by the saliva and the presence of the tongue. The technique we present is somewhat similar to the one described by Mattoo et al in which one component of the assembled cast post slides over the core.¹¹ However, our technique employs a different approach to fabricate the core, although the fabrication of core will depend on the extent of tooth destruction and the angulation of the roots. The use of two components (large and small) has another drawback of accidental injury or swallowing during the clinical procedure. Although both components are small, one should take additional precautionary measures while fabricating the direct pattern.¹² Using a plastic tip that is serrated is a useful tool to develop a pattern within

the oral cavity. Customized handle at the top allows it to be gripped better which reduces chances of accidental swallowing. Moreover the handle can also be marked so as to know the direction in which the pattern has to be inserted within the root canal. This is one of the major problems with direct pattern fabrication since the inadvertent placement of the pattern while the material is soft results in an inappropriate fit of the direct pattern subsequently.

CONCLUSION

Preparing a direct pattern in the mandibular molar region can be cumbersome at times, but with duralay resin that allows incremental build up of core and post one can achieve good results. The technique mentioned in this article is simple and can be mastered with practice.

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