

**Post and Core Treatment of Mandibular Right Canine and Premolar Using a Cast Metal and a Prefabricated Post – A Case Report**

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**Abstract**

Preservation of badly mutilated teeth is a challenge for the dentist. Patients often ignore treatment of carious teeth and only come to the dentist when there is significant loss of tooth structure. Restoration of such teeth is possible with the means of post and core. Post selection is an important determinant of the successful treatment outcomes in such cases. This case report highlights the

usage of post and core to save teeth with less crown structure using cast metal and prefabricated fibre post.

**Keywords:** Periodontium, Hampering, Obturating

**Introduction**

Post and core is a widely used treatment protocol that helps in preservation of grossly decayed teeth or teeth with less crown structure. The biological width is an important factor that has to be kept in mind in the treatment of any tooth. Hampering the biological width

causes deleterious effects on the periodontium of the teeth. To ensure a good healing, the biological width has to be maintained. Post and core treatment helps in restoring the tooth by acting as a reinforcement for the tooth structure. Badly mutilated teeth are weak and susceptible to fracture. Root canal treatment alone can eliminate pain but will not strengthen the tooth structure. Hence, post and core is required in such cases.

Posts are available in a variety of sizes and materials. They can be custom made or prefabricated. The ideal post should be such that it closely conforms to the root canal wall and has sufficient strength to withstand the myriad of forces directed along the long axis of the tooth. The length of post should extend up to 4-5 mm short of the apex leaving the apical gutta percha intact. The apical seal with gutta percha is necessary as maximum incidence of lateral canals is seen in the apical 3mm. The obturating material seals these canals reducing chances of failure of treatment. The custom post is fabricated from cast metal. It provides a good seal to the root canal wall as the post exactly conforms to the anatomy of the root. The impression of the root canal is taken with inlay wax or pattern wax. The wax pattern is casted and the cast post is obtained thereafter.

Prefabricated posts are made from fibre. They are available in a variety of sizes that can be selected according to the width of the root canal. They are not technique sensitive and are easy to perform. The ease of procedure with these posts make them a widely accepted procedure among the dentists. However, they don't conform to the root canal wall and often there is space between the canal wall and the post.

The selection of post is a crucial factor that affects the prognosis of the teeth. It is the clinician's mandate to select a post that best fulfils all the requirements for a successful treatment outcome.

## **Case Report**

A 30 year old male patient reported to the Department of Conservative Dentistry and Endodontics with the chief complaint of pain in lower right front and back tooth region. The patient gave history of sharp shooting continuous pain that was aggravated on intake of hot and cold beverages. On clinical examination, there was presence of caries involving the pulp in right mandibular canine and first premolar. There was also loss of significant tooth structure due to long standing decay and chipping of the tooth structure. Radiographic examination showed caries extending up to the pulp chamber(Figure 1). The patient was advised post and core treatment.



Figure 1: Preoperative radiograph

After administration of local anesthesia, access cavity was prepared in right mandibular canine and first premolar. Working length was established with electronic apex locator and a radiograph was taken for the same (Figure2).

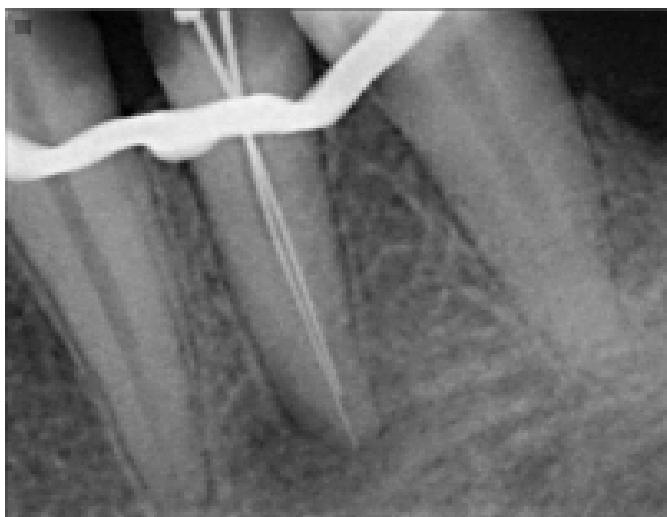


Figure 2: Working length determination

The canals were cleaned and shaped upto 25/0.06 taper using Hyflex EDM. Irrigation was performed with 5.25% sodium hypochlorite and saline during each instrument change. Master cone radiograph was taken as depicted in Figure 3. Obturation was done with mono cone technique using AH Plus sealer. Following this, post space was prepared with peesoreamer upto size 3 leaving the apical 5mm gutta percha technique.



Figure 3: Master cone radiograph

Owing to the wide root canal of mandibular canine, it was decided to do custom post as a single fibre post might not conform to the wide canal anatomy leaving voids all around. A custom post would ensure that the post is exactly like the root canal anatomy and adapts properly in

the wide diameter of the canal. For this impression of the post space was taken using blue inlay wax after application of the separating media. The impression was then invested in phosphate bonded investment material. Burn out was done in the furnace. Subsequently the casting ring was placed in the centrifugal casting machine and casting was done using cast metal. The cast metal post was sandblasted and then finished and polished using carborundum discs. The post was then cemented in the canal of mandibular canine.

Mandibular first premolar presented with two canals. It was decided to prepare post space in the palatal canal. For the ease of preparation, it was decided to put a prefabricated fibre post in this tooth. Post space was prepared using peesoreamers up to size 3. Prefabricated post was selected according to the root canal width. The post was inserted and luted using resin cement. Following this, crown preparation was done was porcelain fused to metal crown was prefabricated and cemented using Type II glass ionomer cement(Figure 4).



Figure 4: Post-operative radiograph

### Discussion

Restoration of the endodontically treated tooth is very important as it has impact on the long-term prognosis of tooth. The root canal treated tooth is mostly associated with the loss of coronal and radicular tooth structure from

preexisting restorations, restorative failures, trauma, dental caries, and endodontic access preparation. When a huge amount of the clinical crown has been lost due to damage, it is often impossible to achieve the sufficient anchorage of a restoration in the remaining dentin.<sup>1</sup>

Trauma and decay are mostly associated with an extensive loss of tooth structure, necessitating restoration of the tooth with a complete crown for esthetic and functional rehabilitation. It is impossible to achieve sufficient anchorage of a restoration in the remaining dentin when a large portion of the crown has been lost to damage. In such situations, post and core restorations are required for additional retention.<sup>2</sup>

A number of different materials have been used for the manufacturing of dental posts. The fundamental posts requirements include high tensile strength, high fatigue resistance to occlusal and shear loading and a good distribution of the forces affecting the tooth root.<sup>3</sup>

The resin fiber post is more similar in its characteristics to natural dentinal structure than any previously used post. It has excellent transverse strength and acts as a shock absorber dissipating much of the stress placed on the finished restoration, transmitting only a small fraction of these forces to the dentinal walls. The fiber post bonds to tooth structure, core materials, and resin cements. It is delivered to the patient in a single-appointment, chairside procedure.<sup>4</sup>

The cast post is indicated in endodontically treated teeth with substantial loss of coronal tooth structure, especially in noncircular canals. However, the use of prefabricated fiber reinforced composite (FRC) post is increasing in contemporary dental practice due to less clinical time, aesthetic colour, and easy retrievability. The additional advantage of FRC post is a compatible modulus of elasticity with dentin and consequent reduced predisposition to the root fracture. Though the endodontic

post is employed to retain the coronal restoration, the presence of post itself predisposes the tooth to the root fracture. Hence proper selection of post and meticulous clinical procedure is critical in the success of post endodontic restorations.<sup>5</sup>

### **Conclusion**

The restoration of endodontically treated teeth with significant loss of tooth structure necessitates post and core treatment. This case reports highlights the usage of two different types of post. There are certain limitations of every post hence, it is mandatory for the clinician to make a proper decision regarding the choice of post. The proper selection of proper post design and material is necessary to ensure a successful treatment outcome.

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