

**Restoration and reinforcement of endodontically treated teeth with a cast post and prefabricated fiberglass post: A case report**

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**Abstract**

Once correctly indicated, endodontic retreatment requires the preservation of dental components. Effective treatment of teeth with severe damage to the structure of the tooth relies not only on successful endodontic treatment, but also on timely post-endodontic tooth repair after the same endodontic. Also for teeth with intracanal posts, the evolution of endodontic procedures and materials has decreased the indication of surgical treatment. A custom cast post or prefabricated fiberglass post and core is shown when a significant volume of tooth structure is missing.

**Keywords:** Cast post, Pre-Fabricated post, post and core, ferrule, post endodontic restoration

**Introduction**

Due to a broad pre-existing reconstruction or thorough access cavity planning, grossly decayed endodontically treated tooth with less coronal tooth structure remaining sometimes presents a difficulty when selecting an appropriate post-endodontic restorative material[1]. Clinicians always face the dilemma of whether or not to use a post or not to go for a direct/indirect restoration, partial/full coverage crown. Again, there is concern about finding a custom cast/prefabricated post. Most endodontically treated teeth have often failed despite root

canal treatment due to poor post-endodontic restoration rather than primary endodontic cause, according to Franklin Weine[2]. Endodontically cleaned anterior teeth can be restored with composite resin with minimal to moderate loss of tooth structure without any decolorization, which provides a good coronal seal and reduces tooth fracture susceptibility. [3,4]. With composite resin teeth with intact cingulum/incisal edge and one or two minor proximal lesions may be repaired.

There are a large variety of post structures that range from conventional cast metal posts to newer fiber posts. The use of fiber posts as an alternative to metal posts is supported by the ease of use, less time consumption for fiber posts along with the laboratory and clinical evidence available. This case report shows cases restoration of carious maxillary incisors by custom cast post in 11 and pre-fabricated post in 22 followed by porcelain fused to metal restorations in both 11 and 21.

### Case Report

A 33 years old male patient presented to the department of Conservative Dentistry and Endodontics with the chief complaint of broken upper front teeth and wanted to get them treated. Patient was apparently asymptomatic 1 year back. There was no history of pain or swelling in the region. After examination there was no tenderness on percussion and no pain on palpation. On Radiographic examination both 11 and 21 were undergone root canal treatment and the obturation was upto the mark. On Recall 2/3 of gutta purcha was removed using peaso reamer in both 11 and 21. Then the tooth preparation was done and ferrule was created in relation to 11 and 21. Finally the wax pattern was taken for cast post. After the cast post and prefabricated post were luted with para core upper and lower impression were taken for crown prosthesis. Establishment of patient esthetics and function was hence achieved.

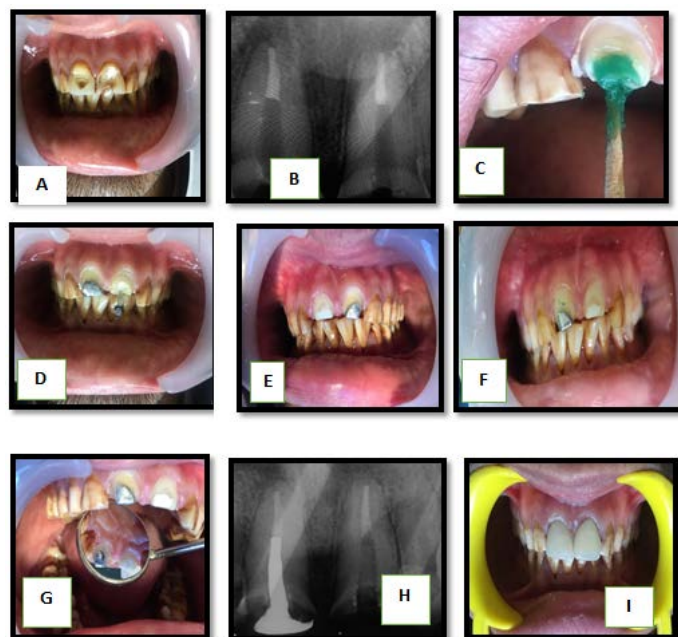


Figure 1 : A) Preoperative clinical picture B) Post space created with respect 11 & 21 C) Wax pattern taken D) Cast post and pre-fabricated post before cementation E) Cast post & pre-fabricated post cementation done F) Tooth preparation done with respect 11 & 21 G) Tooth preparation palatal view H) Post cementation Radiograph I) PFM crown placed

### Discussion

A good post endodontic restoration along with good endodontic treatment often results in healing of periapical inflammation in 91.4% of the teeth, whereas poor restorations and poor endodontic treatment resulted in the absence of periradicular inflammation by only 18.1%. Furthermore, poor endodontic treatment followed by good permanent restoration resulted in 67.6% success rate. This showed clearly that the performance of endodontically treated teeth was far more based on post-endodontic reconstruction than on the standard of endodontic treatment as suggested by Trope and Ray [6].

Cast posts conform to the canal morphology and can be used in all types of canal configurations- oval or elliptical. A slight change in core angulation can be done using cast posts and hence they can be used for correcting proclined

teeth unlike other prefabricated posts [7]. Also, according to Gomez Polo et al, cast metal posts have shown higher survival rates over 10 years [8].

Clinically, it is well known that many factors, such as the design, duration and thickness of the post, the ferrule effect, cementation, and the volume of the remaining tooth material, influence the longevity of root-post-core-crown systems used to restore an endodontically treated tooth. Several in vitro experiments have shown that fiber-reinforced composite posts can have some benefits over metal posts because their elasticity modules are comparable to that of dentine. In the future, this hypothesis of 'module compensation of stress-induced root fractures' may affect post-core-crown restorations. It should, however, be noticed that the material modulus is just one parameter influencing the formation of stress. The diameter of the post should also be taken into consideration, among others. [13]

Ferrule is the circumferential ring of the structure of the tooth enveloped by the crown's cervical part. It provides a bracing operation to strengthen the integrity of the tooth treated by the root canal. It helps the crown and root to act as an incorporated unit and physiologically transmits the occlusal powers to the periodontium [9]. A 2mm ferrule in teeth restored with metal crowns has also been shown to reduce the amount of dentin stress accumulation for various metal and non-metal post systems [10]. Thus, as long as adequate dentin existed, the hardness of the post and core materials did not seem to significantly influence the strain values and fracture resistance. According to Santos Filho PC et al., the presence of a 2 mm crown ferrule surrounding the residual tooth structure has also been reported to improve fracturing resistance of anterior teeth that have been repaired with a cast post and core and ceramic metal crowns [11]. An in vitro study between carbon fiber and traditional cast posts was carried out by

Dean et al. and found that no root fractures were associated with carbon fiber posts, whereas with cast posts, there were root fractures in 50 percent of the teeth. [14] Ferrari et al [12] recorded that after 4 years, the teeth restored with carbon FRC posts had a slightly higher survival rate than the teeth restored with metal posts.

### Conclusion

Selection of suitable post and core system is challenging and should be guided by knowledge of their indications, advantages and disadvantages, as well as the amount and quality of remaining tooth structure and aesthetic requirements. The use of cast metallic posts and prefabricated post and cores are recommended to restore severe loss of coronal tooth structure with insufficient ferrule and to retain metal-ceramic crowns. Establishment of esthetics and function for the patient has been achieved in this case using cast metal posts and metal ceramic crowns for rehabilitation of anterior teeth.

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