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## Endodontically treated teeth with custom cast post and core and metal ceramic crowns restoration: A case report

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### Abstract

There are various post systems and materials available which is used for restoration of fractured tooth structure of endodontically treated teeth. It is a great challenge for the dentist to decide on which system and material to use for restoration of teeth. The reason to use post is to retain the core that holds the definitive prosthesis. Cast metal post and cores are widely used for restoring endodontically treated teeth with extensive loss of tooth structure and to restore with metal-ceramic crowns. The following case report depicts the restoration of fractured teeth after using custom cast post followed by metal-ceramic crowns.

**Keywords:** custom cast post, ferrule, anterior teeth, metal ceramic crowns

### Introduction

Dental caries involving pulp, fractures, and previous restorations results in endodontic treatment of teeth. The moderate or severe loss of coronal tooth structure are built up using various post and core techniques and materials [1, 2]. Appropriate selection of post and core is essential for retentive capacity of remaining tooth structure [3-5]. Anterior teeth with more than 50% tooth structure loss, post and core followed by full coverage restoration is mandatory [6]. According to Franklin Weine, most of endodontically treated teeth often failed flowing root canal treatment due to poor post endodontic restoration rather than primary endodontic cause [7]. Post endodontic material is selected based on amount of tooth structure that is remaining after RCT, esthetics, existing periodontal condition [8].

The ease of use, less time consumption for fiber posts along with the available laboratory and clinical evidence utilises fiber post more than metal posts. The custom made cast post and core with metal ceramic crowns is the traditional choice of treatment. Custom cast post has advantage of approximating and adapting to the morphology of the prepared canal [9]. They are still a better option in cases where change in angulation of the core is required and where there is more tooth structure loss. This case report shows restoration of fractured maxillary incisors by custom cast post followed by porcelain fused to metal restorations.

### Case report

A 21year old male patient reported to the department of prosthodontics with a chief complaint of fractured teeth in his front region. Patient met with road accident three months ago. On clinical examination, fracture was classified under Elli's class III involving considerable dentin, exposing pulp. The patient had undergone endodontic treatment for both maxillary central incisors three months ago due to fracture of his teeth.

A diagnostic impression was made and casts were obtained. Treatment plan was decided which included post space preparation in 11, 21 using Gates drills and endodontic hand instruments for placement of post. The canal was prepared leaving 5mm of gutta-percha to maintain apical seal. Radiograph was taken to confirm obturation and apical seal. Petroleum jelly was used to lubricate the canal space and post space impression was made using autopolymerising resin with direct technique.

Autopolymerising resin was carried into the canal and supported by plastic pattern. Crown lengthening procedure for maxillary central incisors (11, 21) which were severely compromised. Impression was made with irreversible hydrocolloid impression material. Investment of post and core pattern was done and cementation of post was done with glass ionomer cement. Crown lengthening was done in order to increase the crown heights of both 11 and 21 followed by crown preparation and finally restored with metal-ceramic crowns. Initially crown lengthening was done with the help of stent. The presence of adequate crown height of about 1.5-2 mm of sound tooth structure ferrule between the core and the crown margin. Crown preparation for metal-ceramic crowns were done on 11 and 21. Final impression was made with Putty and light body wash impression and casts was prepared in type III dental stone. Provisional restorations was fabricated and luted with non eugenol cement. Shade selection for metal ceramic crowns was matched with adjacent teeth. Individual metal-ceramic crowns made for 11 and 21 were cemented using glass ionomer (GIC) cements.

**Discussion**

Endodontically treated teeth and fractured teeth are usually restored with custom metallic cast post or prefabricated post and core followed by full coverage crowns. Full coverage crowns can be either metal ceramic or all-ceramic crowns. The advantage of custom cast post and core restoration is the precise fit with minimal luting cement interface and inherent antirotation mechanism [10]. They also have advantage of high strength and minimal tooth reduction during root canal crown preparation.

Success of post and core mainly depends upon amount of preservation of tooth structure [11].

Custom-made metallic post and core combined with metal-ceramic individual crowns were used in this case due to various reasons such as extensive loss of anterior teeth structure, coronal destruction and functional rehabilitation.

Function of post is to build up and securely retain the core for crown retention but this post doesn't strengthen or reinforce endodontically treated teeth [12-16].

According to Santos Filho PC *et al.* it has been found that the presence of a 2mm crown ferrule surrounding remaining tooth structure enhanced fracture resistance of anterior teeth which were restored with a cast post and core and metal ceramic crowns [17].



**Fig 1:** Pre-operative photograph



**Fig 2:** Preoperative intraoral view- 11, 21



**Fig 3:** Intraoral periapical radiograph- 11, 21



**Fig 4:** Intraoral view-crown preparation in 11, 21



**Fig 5:** Putty light body wash impression made



**Fig 6:** Cementation of temporization with Zoe cement



**Fig 10:** Intraoral frontal view-cementation of metal ceramic crowns in 11, 21 with GIC cement



**Fig 7:** Fabrication of metal cast post in 11, 21



**Fig 11:** Postoperative frontal view



**Fig 8:** Cementation of cast metal post with GIC cement



**Fig 9:** Crown lengthening in 11, 21

**Conclusion**

It is important to select proper post and core system and material for the long term success or treatment. The use of custom cast post and cores are recommended to restore severe loss of coronal tooth structure and to retain metal-ceramic crowns. Restoration of teeth after endodontic treatment is the integral part of restorative dentistry. The treatment described is simple and effective and is used for long term success of treatment of fractured teeth.

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