

CASE REPORT

Esthetic Rehabilitation of Mutilated Anterior Teeth with Custom Cast Post and Core Porcelain-Fused-to-Metal Crowns

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ABSTRACT

An endodontically treated anterior tooth requires extra-coronal restoration when the tooth structure is weakened or lost due to caries, endodontic treatment, placement of previous restorations and/or is discolored. The reduced tooth structure makes retention of extracoronary restoration difficult. The purpose of post is to provide retention for the core restoration, which replaces lost coronal structure. This article describes restoration of mutilated maxillary central incisors by using cast post and core, followed with porcelain fused to metal restorations.

Keywords: Cast post and core, Esthetics, Endodontic, Porcelain-fused-to-metal.

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INTRODUCTION

An endodontically treated tooth has considerable tooth loss because of earlier carious decay, endodontic treatment and the placement of previous restorations. The reduced tooth structure makes retention of subsequent restorations more challenging.¹ If substantial amount of coronal structure is missing, a post and core restoration is indicated. The main purpose of this procedure is to provide retention for the core restoration, which replaces lost coronal structure.² Custom cast post has advantage of approximating and adapting to the morphology of the prepared canal.³ This article describes restoration of mutilated maxillary central incisors by using cast post and core, followed with porcelain fused to metal restorations.

CASE REPORT

A 34-year-old female patient reported to our division with the chief complain of poor esthetics of her front teeth. She had sustained trauma to her anterior teeth 18 years back, which were managed by root canal therapy. Medical and personal history was noncontributory. Intra-oral examination revealed 11, 21 had been restored with acrylic crowns, and 22 was discolored (Figs 1A to D). Patient presented with canine-guided occlusion, with no other hard and soft tissue abnormalities. On radiographic evaluation, 11, 21 were found to be endodontically treated and 21 had prefabricated post placed (Figs 2A to D). Vitality tests revealed 22 to be nonvital. Removal of acrylic crowns revealed severely compromised coronal tooth structure of 11 and 21 (Figs 1A to D). The treatment plan included endodontic treatment of 22, followed by cast post and core in 11 and 21, and porcelain fused to metal crowns in 11, 21 and 22.

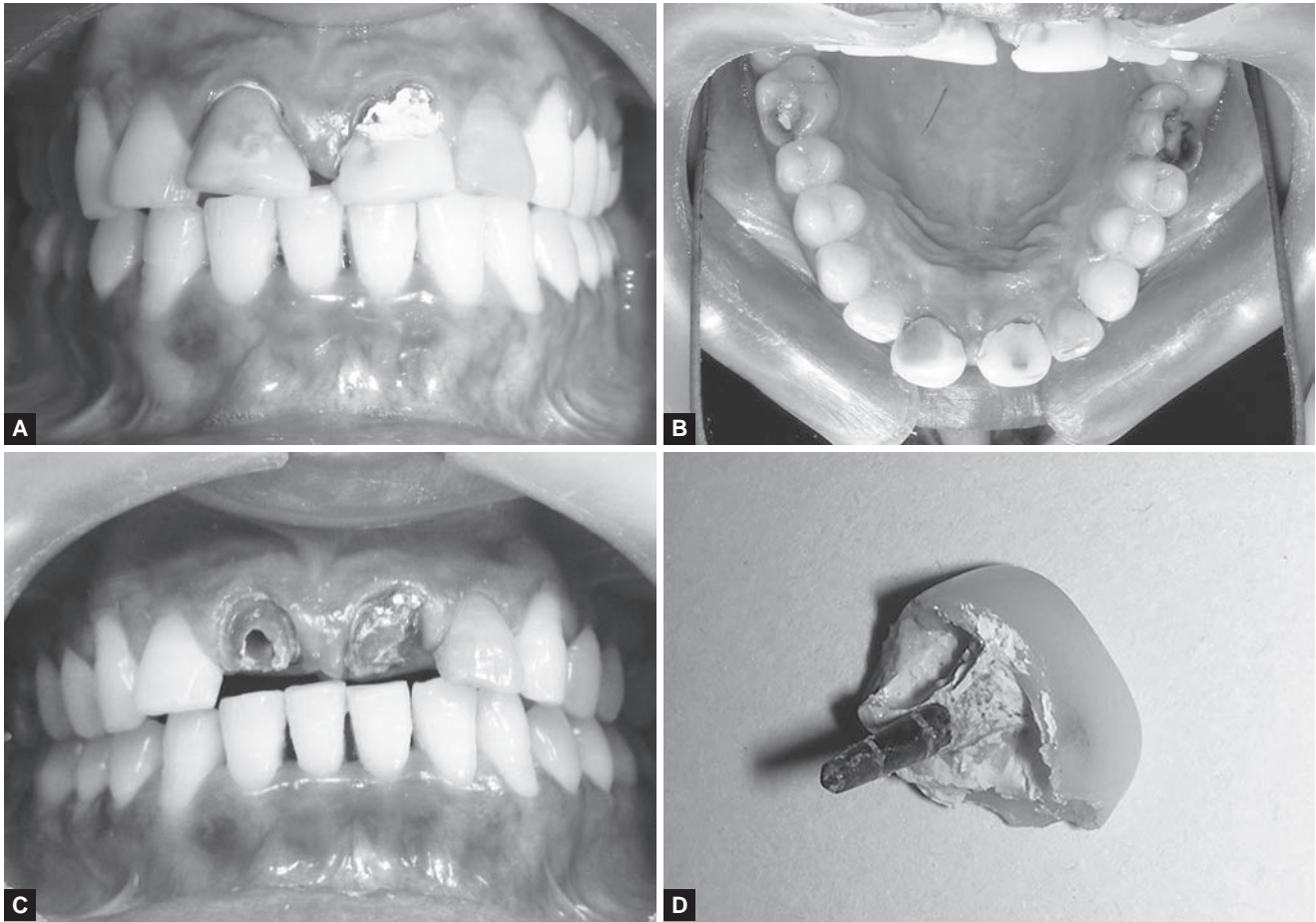
After completion of endodontic treatment in 22, post space was prepared in 11, 21 using Gates drills and endodontic hand instruments to accept post. The canal was prepared so as to have a 5 mm of apical gutta-percha to maintain the apical seal. The apical seal and remaining endodontic obturation was confirmed on radiograph. The canal space was lubricated using petroleum jelly and impression of post space was made by direct technique using autopolymerising resin. The autopolymerising resin was carried into the canal and supported by plastic pattern. Core build-up was also done with autopolymerising resin. Crown preparation for porcelain fused to metal crowns was done on 11 and 21. Impression was made in irreversible hydrocolloid impression material and casts was prepared in type III dental stone. Provisional restorations were fabricated and luted with noneugenol cement.

Post and core pattern was invested immediately and casting was done with special precaution of mixing distilled water with investment taken to avoid of expansion of mold. The cast post and core was cemented with glass ionomer cement (Fig. 3). Crown preparation was done on 22 for PFM crown. Final impression was made in poly-vinyl siloxane impression material (3M). The shade for the ceramic was matched from adjacent teeth. Provisional restorations was modified to include 22 and luted back

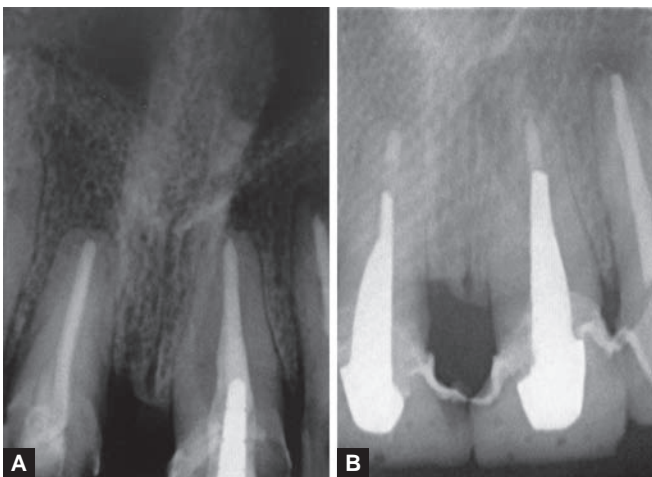
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Figs 1A to D: Preoperative photographs: (A) Facial view, (B) palatal view, (C) after removal of acrylic crowns and cement and (D) the removed post-core restoration



Figs 2A and B: (A) Preoperative radiograph with prefabricated metal post in 21 and (B) postoperative radiograph with cast post and core in 11 and 21

with noneugenol cement. Individual porcelain fused to metal crowns were made for 11, 21 and 22 and cemented using glass ionomer cement (Fig. 4).

DISCUSSION

Treatment options advocated for endodontically treated anterior fractured and discolored teeth are to restore it with either custom made cast post and core or

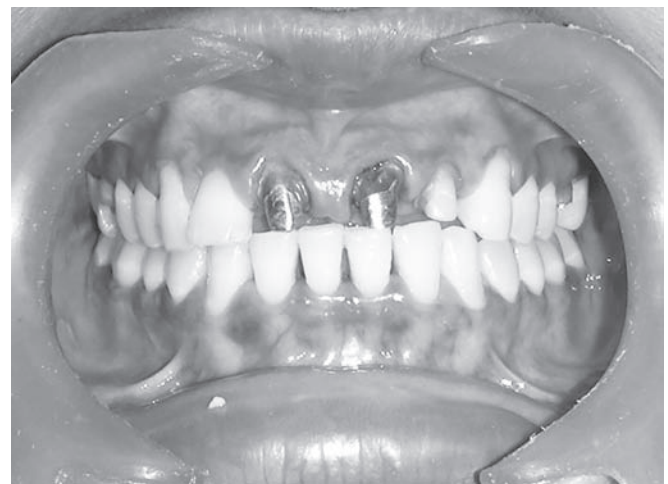


Fig. 3: Cast post and core cemented

prefabricated post followed by complete coverage crown. Crown choices include ceramic crown with metal or metal free.

Since patient had compromised tooth structure, the treatment option chosen was metal ceramic crown as it will be able to mask the underlying discoloration and provide esthetic restoration. All ceramic crowns do not mask the discoloration, and tooth structure was inadequate for adhesive bonding. In teeth with ovoid, elliptical or



Fig. 4: Metal ceramic crowns cemented

conical canal, as in the present case, custom cast post-core restoration offer advantage in the form of precise fit with minimal luting cement interface and inherent anti-rotation mechanism.⁴ The custom cast posts also have advantage of higher strength and minimal reduction of tooth material during root canal and crown preparation. Amount of remaining tooth structure is directly related to the strength of tooth. Hence, utmost preservation of tooth structure is important for successful post and core restoration.⁵

The prefabricated posts are available as metal posts (stainless steel, titanium), fiber posts (carbon, glass) and ceramic posts (Zirconia). The prefabricated posts are round in cross-section and may have different surface characteristics (serrated, smooth, threaded and roughened). The shape of posts available are parallel and tapered and are provided with matching drills for post space creation. Hence, obtaining precise fit with

these posts result in removal of more tooth material as compared to custom cast post and core. Also, an anti-rotation feature needs to be provided. Prefabricated posts have become very popular recently due to the introduction of radiopaque and translucent fiber-reinforced posts. These posts allow the post and core fabrication in single appointment, and use of esthetic all ceramic crowns. But, fiber and ceramic posts require adhesive bonding which is a technique sensitive procedure.

There are several post and core options available. But, choice should not be based on set guidelines. Each individual's tooth condition, degree of discoloration, success of endodontic treatment, root length, and effect of previous restorations should be taken into account before selecting a particular post and core restoration. Dentistry is varying with induction of modern science to practice dentistry.⁶

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