

Aesthetic Rehabilitation in Prosthodontics Using Fiber Reinforced Post, Composite Core Buildup & Zirconia Crown Restoration - A Case Report

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ABSTRACT

Background: In today's world, patients have become more esthetically conscious and demanding, role of a prosthodontist has also widened and now it is not just limited to mere replacement of missing teeth but has also included ways to incorporate esthetic dentistry termed as esthetic prosthodontics. In today's world, patients have become more esthetically conscious and demanding, role of a prosthodontist has also widened and now it is not just limited to mere replacement of missing teeth but has also included ways to incorporate esthetic dentistry termed as esthetic prosthodontics. In today's world, patients have become more esthetically conscious and demanding, role of a prosthodontist has also widened and now it is not just limited to mere replacement of missing teeth but has also included ways to incorporate esthetic dentistry termed as esthetic prosthodontics. In Current scenario patients have become more conscious about aesthetics. Now the role of Prosthodontist is not just limited to the replacement of teeth but also incorporate esthetics in terms of restoration. The post and core build-up is used for the rehabilitation of the severely damaged tooth to provide more retention and resistance. Newer technologies coming in fiber reinforced composite presents an alternative to conventional metal ceramic restoration.

Case report: 33 years old male patient complaint of discoloration and fracture of restoration in upper front region and lower front region since 10 months. On examination the tooth was non-vital and Root canal treated with the failure of cast post restoration in relation to 11,21,41 and dislodged crown with prepared tooth irt 12,22 which was treated with FRC Post with core build up in relation to 11,21,41 followed by single zirconia crowns in relation to 11,12,21,22,41

Conclusion: The novel application of fiber-reinforced composite resin for use with fixed prostheses is an exciting innovation. However, evidence-based guidelines for clinical indications, prosthesis design, and tooth preparation are required along with information regarding longevity. Application of a resin-coating technique and light-polymerizable hybrid composite resin for cementation could be a promising innovation in clinical dental practice.

Keywords: Cast post, FRC post, Core build up, FRC Crowns, Zirconia crowns

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I. INTRODUCTION

Currently several options are available for the replacement of a single missing tooth. For many years, metalceramic fixed dental prostheses (FDPs) have been the treatment of choice for this purpose, and recently, all-ceramic FDPs have been recommended. In metalmetal-ceramic and all-ceramic more tooth reduction is required to provide both retention and stability.²

In these situations, a resin-bonded FDP provide an alternative treatment option. Resin bonded FDPs have been constructed from ceramic bonded to the metal framework followed by the cementation using resin cements. Fiber-reinforced composite resin (FRC) has been suggested as an alternative material for the construction of resin-bonded FDPs, and its use in the past decade has increased markedly.³

II. CASE REPORT

A 33-year old male patient reported to the Department of Prosthodontics, SRM Dental College, Ramapuram, Chennai, with a chief complaint of discoloration and fracture of restoration in upper front and lower front region since 10 months. Patient reveals history of Root canal treatment (RCT) done in the upper front tooth region 2 years back and had difficulty in communication and mastication. On intra-oral examination buccal mucosa was pink in color, floor of the mouth was also pink in color, hard palate normal with class 1 soft palate, tongue class 1, saliva class 1 with Patient have underwent RCT and post preparation in relation to 11, 21, 41, 1 year ago, calculus ++ and Molar relation class 1. (Figure. 1 and 2)

Investigation

An intraoral periapical radiographs was taken which demonstrated root canal treated tooth in relation to 11,12,21,22,41. Based on clinical and radiographic findings, the diagnosis of dislodged restoration was observed.

Treatment

Before the commencement of the treatment, all procedures were explained and informed consent was taken from the patient for the treatment. Oral prophylaxis was done in the patient. Various treatment options were discussed which included conventional Fixed dental prosthesis with PFM Crowns. Owing to its minimally invasive nature and excellent aesthetic qualities it was decided to enhance his appearance using Post space preparation and composite core buildup followed by FRC Post placement and Zirconia crowns cementation.

Procedure

1. Maxillary and mandibular diagnostic impressions were obtained with Alginate (QualaFsAlgina, USA) (Figure.3)
2. The procedures for post placement involved guttapercha (GP)(Spident USA Inc) removal with Peaso reamer (Mani peeso reamer India) and gates glidden (Dentspy Kerr USA) leaving only 5 mm of the GP apically.
3. The root canal was etched (Ultradent products USA Inc) and dried after which the FRC Post (EverStick® GC India) of size 1.2 mm was placed inside the canal and then was light cured with a light-curing device (Mini L.E.D OEM®, France, 420-480 nm), for 20 seconds.
4. An x-ray was taken to confirm the fitting of the posts inside the canal. The post was then cemented with dual cure glass-reinforced composite (ParaCoreColtene®, Switzerland). (Figure. 4)
5. Composite core build up was done using resin composite shade A3 (Filtex Z350®, 3M ESPE, USA) Final x-ray was taken. (Figure. 6)
6. The margins for the crowns were prepared 0.5mm subgingivally.
7. Teeth preparation 12,22 was done using conventional diamond, tapered, rounded end burs. The preparations consisted of removing approximately 1.0 mm of enamel on the lingual and proximal aspects of abutment teeth (partial wraparound). (Figure. 5)
8. Occlusal reduction of 2 mm was required to ensure adequate space for placement of the Zirconia crowns.
9. Impression was recorded with heavy body material (Aquasil Ultra® (DENTSPLY, Denmark) and light body (Examix NDS®, GC, USA).
10. Designing of the all ceramics zirconia crowns are done using Exo CAD software. (Figure.7)

Cementation

The intaglio surface was etched using 30% Hydrofluoric gel (Porcelain etch Dentmart India) rinsed and coated with a silane coupling agent (Silane coupling agent, Kerr, USA) 37% phosphoric acid (Etching Gel, Kerr, USA) was applied on the enamel surfaces for 15 seconds and rinsed with water spray for 20 seconds and dried. Bonding agent (Adper Single Bond, 3M ESPE, USA) was applied in two layers on the prepared tooth and polymerized with a light-curing unit (Demi LED Light Curing System, 450 nm, Kerr, USA) for 20 seconds,

excess was removed after that luting resin was cured using visible light activation unit for 40 seconds . Post cementation crowns were cleaned for excess and post instructions given. (Figure.8)

III. DISCUSSION

Intra coronal Restoration is one of the widely used treatment options for anterior restorations. Over preparation of the canal in case of retreatment can be one of the treatment complications. Prefabricated post adaptation in a wide canal is difficult so to overcome that further reduction of remaining tooth tissue is needed to shape the canal before the prefabricated post placement. Poorly adapted post will lead to failure of restoration.⁴

It is important to have esthetic consideration when planning for intracanal restoration for anterior teeth. Both aspects of maintaining the integrity of the restoration and providing good esthetic outcome at the end of the treatment were being considered when planning the final treatment for this patient.⁵

EverStick® is a type of fiber reinforced composite post made of individually formable and unpolymerised glass fiber post, which is mouldable in nature allowing to follow the shape of the canal. The material also allows operator to add on or cut the bundle to cater the size of the canal at the chairside.⁶ Owing to a greater similarity in elastic properties with dentine, FRC posts allow relatively uniform stress distribution to the tooth and the surrounding tissues, thus yielding a protective effect against root fracture.⁷

Studies reported the fracture line of a fiber post is at the favourable site when compared to cast metal post and allows repair if failure occurs. Ferrule effect is also an another factor that is important in planning intracanal restoration.⁸ As the amount of tooth tissue left is minimal in tooth 11,21,41 ferrule effect was compromised. The downfall of using a less rigid material as an intracoronary restoration was the amount of stress will be greater, thus ferrule should be preserved.⁹

IV. CONCLUSION

Fiber reinforced composite post helps in restoring the endodontically treated teeth with minimal tooth tissue left and provide adequate retention and resistance. It also allows maximum area of the canal to be filled with post material and increase the adaptation of the post to canal. All ceramic crowns enhances the esthetic, quality and longevity of the restoration.

CONFLICT OF INTEREST Nil

SOURCE OF SUPPORT Nil

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Figure 1: Preoperative Frontal view



Figure 2: Preoperative Occlusalview



Figure 3: Diagnostic Impression



Figure 4: Tooth Preparation



Figure 5: Composite Build up

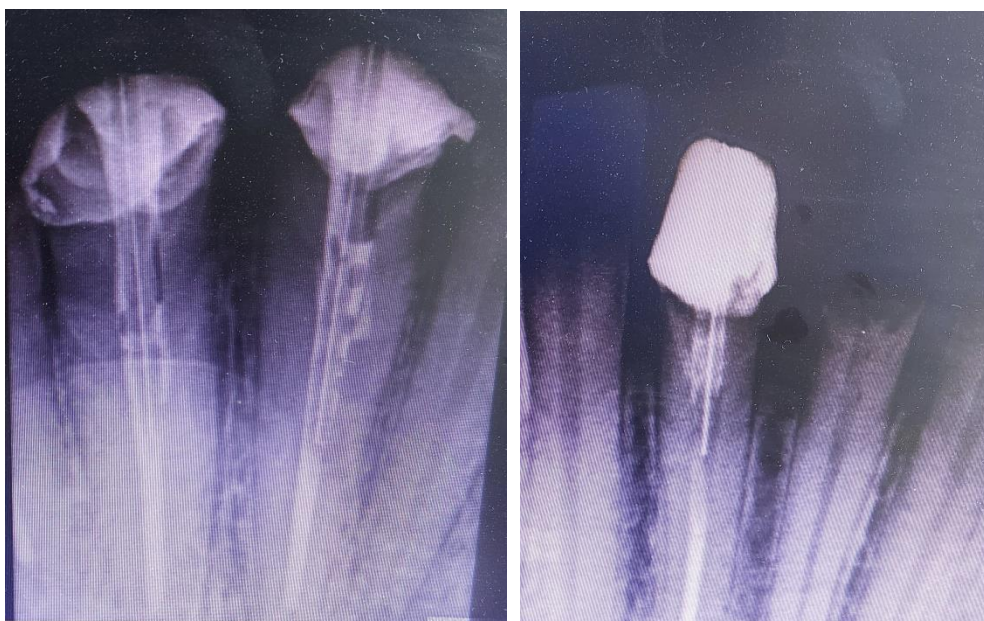


Figure 6: Radiography Assessment



Figure 7: Designing using Exocad Software



Figure 8: Post Cementation