

INLAY RETAINED FIXED DENTAL PROSTHESIS AND AN ENDOCROWN- A MINIMALLY INVASIVE APPROACH

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ABSTRACT

Missing teeth is an extremely common clinical encounter that dentists come across. Various treatment options exist for such a situation including fixed partial dentures and dental implants. In a single missing tooth scenario, dental implants are often the most lucrative and sought-after treatment. These options are invasive and sacrifice a lot of tooth structure. But, in certain situations such as a financial constraint of the patient alternate treatment options are sought. In these situations, resin bonded posterior Fixed Dental Prosthesis (RBFDP) are excellent treatment options. These resin-bonded posterior Fixed Dental Prosthesis (RBFDP) offer an effective and great esthetic outcome for the patient Post and core followed by crown is often a treatment option for severely broken-down teeth. Endocrown is an excellent alternative treatment option in such cases. This case report describes a minimally invasive technique of inlay retained posterior fixed dental prosthesis made of monolithic zirconia and a lithium disilicate endocrown.

Key words: Fixed prosthodontics, Endo crown, Minimally invasive, Resin bonded fixed prosthesis, Luting.

Introduction

Partial edentulousness is a common occurrence in today's world and a conventional fixed dental prosthesis requires the removal of a significant amount of tooth structure. This removal can amount to up to seventy per cent of the mass of the clinical crown [1]. In a single missing tooth scenario, dental implants are often the most lucrative and sought-after treatment. But, in certain situations such as a financial constraint of the patient alternate treatment options are sought [2]. In these situations, resin bonded posterior Fixed Dental Prosthesis (RBFDP) are excellent treatment options. These RBFDP offer an effective and great esthetic outcome for the patient [3]. Endocrowns are a great alternative to the conventional crown especially for root canal treated molar teeth. Lithium disilicate has been recommended as the material of choice for endo crowns [4-6].

Case report

A patient aged 21 reported to the out-patient department with the chief complaint of missing teeth in the right upper back tooth region and dislodged metal crown concerning the right lower back tooth region. The patient gave a history of dislodgement of the crown 4 days ago and desired a metal-free prosthesis. On intraoral examination, it was noted that tooth number 16 was missing, but the space for its replacement mesiodistally was compromised and the space available was 5 mm mesiodistally. Furthermore, root canal treated 46 was noted with a chamfer margin. Furthermore, there was secondary caries noted on 46 teeth (**Figures 1-3**).



Figure 1. Pre-op maxillary arch



Figure 2. Pre-op mandibular arch



Figure 3. Pre-op Occlusion of the patient

The patient was explained about the treatment options for missing 16 which included fixed dental prosthesis (FDP), dental implant and RBFDP. The patient did not want to undergo dental implant surgery and chose an inlay retained fixed dental prosthesis (IRFDP). For 46 teeth patient was given an option of endo crown and a conventional full-contour crown. The patient decided to go ahead with an endo crown for 46 teeth.

*Preparation, scanning and milling technique
For Inlay Retained FDP*

For the missing 16, inlay preparations were done in 15 and 17 teeth. The buccolingual width of the inlay preparation was kept at one third the intercusp distance and the depth of preparation was about 2 mm. The gingival seat area was prepared to about 1.5 mm depth on both the second molar and the premolar. Following this a Putty and light body impression was made using additional silicone impression material. (Dentsply, Aquasil) The impressions were poured using a type IV gypsum product die stone. (Kalabhai, Ultrarock) The designing of the ILFPD was done using CAD/CAM software Sirona (INLABSW4). The CAD/CAM system has five phases that are, administration, scan, model, design and milling. In administration the basic details of the patient are added, following which, the tooth numbers are added. Then the zirconia material (inCoris TZI C, Dentsply Sirona) is selected.

In the second stage, Sirona INOES Blue is used to scan the model. Before scanning CEREC optic spray (Sirona) is used to provide appropriate optical illumination. In the third stage, the axis of the restoration is set. Furthermore, an appropriate preparation margin is drawn. The next stage involved the calculation of the restoration by the software. The areas of excess and inadequate thickness are indicated and alterations are made appropriately. Following this milling command was given (**Figure 4**).

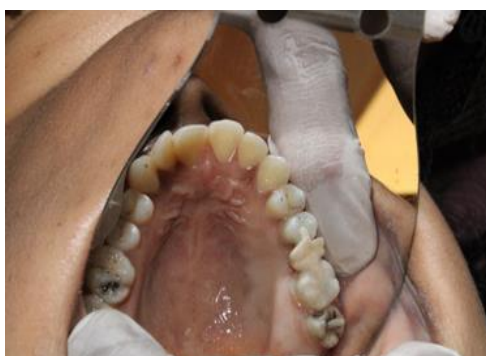


Figure 4. Inlay retained posterior fixed dental prosthesis made of monolithic zirconia

Endocrown

Initially, the secondary caries was removed in 46. The access cavity was restored using composite resin and the walls of

the cavity were kept well rounded. The Chamfer margin on the tooth was refined and an impression using putty and light body impression was made. (Dentsply Sirona, Aquasil). The impressions were poured using die stone. (Kalabhai, Ultrarock). The designing of the endo crown was done similarly except for the material selection which was Ivoclar Vivadent IPS E max CAD Low Translucency block (shade A2). Following this milling was done (Sirona InLAB Milling) (**Figure 5**).



Figure 5. Endocrown with respect to 46

Treatment and luting

The Zirconia RBFDP was sintered and glazed and the Lithium disilicate was glazed before trial in the patient's mouth. The RBFDP was first sandblasted using Cobra, Aluminium Oxide, 25µm at 1 bar of pressure, following which Monobond plus (Ivoclar Vivadent) is used for 60 seconds. The RBFDP was luted using Multilink resin cement (Ivoclar Vivadent). The endo crown is etched with 5% hydrofluoric acid followed by Monobond for 60 seconds and then luted with Multilink resin cement.

Follow-up

The patient was followed up after 6 months and 1 year. There were no complications with the prosthesis.

Conclusion

Monolithic Zirconia in the form of inlay retained resin bonded FDP can be used as an effective and a conservative approach for managing single missing teeth. Endocrowns serve as an excellent alternative to the conventional post and core followed by a full contour crown patient. Long term follow-up studies on inlay retained resin bonded FDP has to be done to make it a mainstay treatment modality.

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