

## Resin Bonded Fixed Partial Denture is an Alternative Conservative Treatment in Anterior Short Span for a Medically Compromised Patient: A Clinical Report

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### Abstract

Resin bonded fixed partial denture (RBFDP) has been used clinically since the 1970s, and offers a more conservative approach than conventional fixed prosthesis for restoring edentulous short span. RBFDP is inexpensive to fabricate, easy to insert, and has been shown to be cost effective for the patients. In the present article, this type of restoration has been tried to restore mandibular anterior edentulous span. Other treatment options have been ruled out, because of the patient's medical condition, or the patient's preference. The patient has been followed-up for more than two-year without any complication.

**Keywords:** Resin bonded fixed partial denture; Maryland bridge; Resin bonded bridge; Rheumatoid arthritis; Osteoporosis; Dental implant; Medically compromised patients

### Introduction

Resin bonded fixed partial dentures (RBFDPs) are conservative fixed prostheses which have been used for more than 40 years, particularly these restorations are depending on resin cements for their retention. These restorations have been first defined in 1970s and meanwhile they have substantially developed. The first type of RBFDPs was the Rochette Bridge, which depend on the retention produced by resin cement tags through a specific perforated metal retainer [1]. However, the longevity of this type was limited, and different procedures have been introduced to alter the metal surface for improving micromechanical retention [2]. The term Maryland Bridge resulted from the development of electrochemical etching technique at the University of Maryland [3]. Recently the developments of resin cements have improved these types of restorations' retention, which bond chemically to tooth structure and metal alloy. The significant advantage of these restorations is minimally invasive tooth preparation especially in periodontally involved teeth [2], which makes the procedure reversible for the next few years. Other advantages are no dentine involvement in tooth preparation, saving tooth from pulp exposure, usually no need for local anesthesia because of conservative preparation, and making easier dental impression because normally the finishing line is supragingival and no need for soft tissue retraction. Disadvantages include esthetic compromised by shiny line through the retainer, which result in discoloration of the abutment teeth [4]. This dilemma can be avoided by using opaque luting cement, but this alternative choice is not always suitable especially when there is high translucent incisal edge, which leads to highly visible white line. The purpose of this clinical report is to present the use of RBFDP in a patient with osteoporosis for restoring mandibular central incisor, when other treatment option such as implant placement, or FPD was not possible.

### Case Report

A 59-year-old female was presented to the Department of Prosthodontics in Tehran University of Medical Sciences (TUMS) with a chief complaint for restoring tooth #31. Past dental history revealed the patient had extracted the tooth because of compromised periodontal disease 1-year ago. Past medical history was remarkable with Rheumatoid Arthritis associated with Osteoporosis 10-year ago. The patient was taking several medications for the last ten years, which are: Fosamax (alendronate Sodium) Tablet 70 mg per week, Azathioprine tablet 100 mg per day, Prednisolone tablet 30 mg per day, Vitamin D supplement 600 IU per day. Intra-oral examination showed

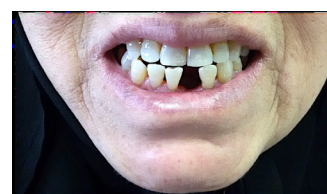


Figure 1: Patient's frontal view.



Figure 2: Before surgery.

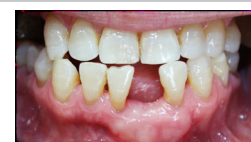


Figure 3: After FGG surgery.

the space of the extracted tooth somehow larger than the size of normal central incisor with deficiency in attached gingiva (Figure 1). Clinically, the adjacent teeth #41&32) revealed grade I mobility. According to the patient's medical condition the implant option was excluded. The risk of incidence of osteoradionecrosis of the jaw (BRONJ) is high in patients taking oral bisphosphonate with immunosuppressive drugs for a long time. 3-unit FPD option was discussed with the patient, but the patient rejected the idea of preparing the teeth, and she was insisting on minimally invasive treatment modality. The patient also

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refused the conventional RPD choice, and preferred fixed treatment. The 3-unit RBFDP was selected as the most appropriate option to be fabricated. Before starting the prosthetic stage, the patient was referred to the Department of Periodontics to undergo FGG surgical procedure to reconstruct the attached gingiva in #31 place (Figures 2 and 3). After 6 weeks, the patient returned for prosthetic phase initiation. The preparation of the abutments teeth was kept to the minimum with only ledge formation on the lingual surfaces of teeth #32&41) to avoid extension of the metal framework onto the thinner incisal third, which would compromise the esthetics. The proximal walls of both abutments were paralleled to ensure the passive path of insertion of the prosthesis. The impression made with two-step technique soft putty-wash A-silicon (Panasil® initial contact X-Light, Kettenbach) (Figure 4). The metal framework was waxed up, casted with an alloy containing 74% Ni and 13% Cr (Williams Pisces, Ivoclar Vivadent, Amherst, NY, USA) The framework was tried in during a separate appointment (Figure 5), after verification of optimal fit, sent to the laboratory where the veneering porcelain was built up and fired. The tissue side of the pontic was contoured to place slight pressure on the gingiva at delivery in order to assure a tightly adapted tissue surface and adequate support of the interproximal papillae. The metal bonding surface was acid etched in the dental laboratory and air-abraded with a micro-sandblaster (Microetcher ERC, Danville Engineering, San Ramon, CA, USA) in the dental office to enhance the micromechanical and chemical bond of resin cements to the metal surface. Final cementation was accomplished with opaque dual-curing resin cement (Panavia F2.0, Kuraray CO. Ltd, Osaka, Japan). The occlusal contact was too light on the prosthesis to decrease the occlusal load (Figure 6). The patient was followed-up for more than 2 year with no obvious problems, and the mobility of the abutments was completely reduced.

## Discussion

Medically compromised patients in treatment with oral bisphosphonate and immunosuppressive or similar, corticoids drugs are considered as absolute contraindication for dental implants surgical intervention [5-7]. In this clinical case, the patient had another treatment options selection, but the patient preferred the most conservative fixed treatment modality. Despite the acknowledged advantages of RBFDP, the



Figure 4: Dental impression.



Figure 5: Framework try-in.



Figure 6: Delivery of the restoration.

role of these restorations as definitive treatment remains controversial due to a lack of long-term prospective data concerning success. The majority of data is based on the results of longitudinal studies, many of which have been poorly controlled, used a variety of cements and preparation techniques making it difficult to isolate factors affecting the outcomes. Several systematic reviews have appraised the five-year survival rates for bridgework as 87.7% for resin bonded prostheses [8], and just over 90% for conventional bridges depending on design [9]. Although these rates are lower than the 94.5% success reported for implant retained single crowns over the same 5 year follow up [10]. Advantages of RPFDPs can be summarized as less invasive and reversible treatment opportunity with little or no tooth preparation, which decrease damage to abutments teeth. Patient preference with such options because require shorter total chair time, and less financial commitment. Another point this type of restorations is easy to fabricate, making impression, bite registration, and shade selection. There are several potential disadvantages reviewed in the literature included more conceivable debonding when compared to conventional fixed restorations. Aesthetics is another issue associated with this type of restorations with incisal shine through of metal especially when opaque cement is not used. When diastemas or large/small pontic space are present, it is often difficult to distribute the suitable space between the abutment teeth and pontic. Small edentulous span is usually more successful than larger ones. Temporization of the restoration is not possible, this limitation prevents the evaluation of aesthetics, occlusion, and speech. The most undesirable concern with such prostheses is the debonding from retainer/abutment teeth, which in turn decrease the longevity of these restorations. Early composite resin cements revealed degradation and reduced bond strength with time. With the introduction of self-adhesive Panavia cement, which expresses high bond strengths. This is due to formation of chemical bond between the phosphate group of the cement monomer and the oxide layer on the metal retainer. Sandblasting to create micromechanical interlocking should be carried out before cementation for further retention enhancement. In order to produce maximum bond strengths these restorations require uncontaminated, etched and primed enamel or dentine. The use of rubber dam during cementation procedure could be considered as mandatory particularly in posterior region in order to reduce the risk of debonding, however in anterior maxillary/mandibular aspects the isolation method can be achieved using the cotton rolls and saliva ejectors. One study has evaluated the role of RBFDPs in fixed prosthodontics in regard to case selection, bridge design, and clinical techniques. According to the authors' conclusion, they recommended the RBFDP should be considered more frequently as the restoration of choice in short span reconstruction [3].

## Conclusion

In this article, the use of RBFDP in restoring short span has been presented. Because the patient was medically compromised with Rheumatoid Arthritis associated Osteoporosis, and was taking bisphosphonate medication for about 10 years, implant option was impossible. The patient was satisfied about the result with resin-bonded bridge, and has been followed-up for more than 2 year with no complications.

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