

## CASE REPORT

# Esthetic Replacement of Maxillary Lateral Incisor with Maryland Lever Prosthesis: A Novel Conservative Approach

Venkat Aditya Sunki, Krishna Mohan Reddy, CH Vamsi Krishna, Nidhi Gupta

## ABSTRACT

Dentists often question the use of resin-bonded fixed partial dentures (RBFDPs) for reliable restoration of tooth-bound edentulous spaces. Initial attempts at bonding fixed partial dentures on teeth resulted in early failure due to debonding. In the 1980s and 1990s, improvements in preparation methods, metal alloys and bonding techniques made the RBFDP a more predictable option. This article provides a case report of a restoring a missing maxillary lateral incisor with modified Maryland with the advantages of being fixed to provide a stronger bond as well as being kinder to the periodontal tissues.

**Keywords:** Resin-bonded prosthesis, Adhesive technique, Fixed partial denture, Modified bridge.

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## INTRODUCTION

The prosthetic restoration of small edentulous span poses a dilemma when the adjacent teeth do not require crowns. It is difficult to justify extensive reduction of the adjacent teeth to support a conventional fixed partial denture. A single-tooth implant is an alternative for patients with adequate bone dimensions and who are willing to undergo a minor surgical procedure. However, oral implants are not the treatment of choice for many patients and the resin-bonded fixed partial denture (RBFDP) offers a possible solution.<sup>1</sup>

In the 30 years since the first resin-bonded prosthesis was described, this technique for splinting the mobile teeth has developed into conservative method for replacing missing teeth. Early resin-bonded prostheses have been associated with lower retention rates than conventional bridges due to limited bond strength between enamel and metal framework. Despite improvements in the adhesive bond strength the biomechanical design of the resin-bonded prosthesis did not develop with the same rapidity and predictability, through ongoing development, studies have shown various biomechanical design that improve clinical retention.<sup>2</sup>

This article provides a case of restoration of edentulous space for missing lateral incisor with a fixed design, combination of conventional and resin-bonded prosthesis.

## CASE REPORT

A 25 years old male patient by name Mr Suresh, with a history of trauma 10 years back reported to department of prosthodontic with a missing left lateral incisor and desired a fixed prosthesis. On intraoral examination patient had full complement of teeth with a missing maxillary left lateral incisor, with a long edentulous span for two lateral incisors and mesially tilted canine. Patient had class I occlusal relation with normal overjet and overbite, clinical and radiographic evaluation of the abutment teeth revealed good periodontal health (Fig. 1). Treatment options given to patient were: (i) Replacement with two implants because of the long edentulous span, (ii) replacement with conventional fixed partial denture with 21 and 23 as abutments, (iii) a combination design of conventional and resin-bonded prosthesis.

The patient rejected the implant option because of the duration of therapy and requirement for surgical intervention. Likewise, a conventional FPD was refused because patient was not willing for removal of healthy dental tissue. The third option of combination design was convincing for the patient since it involved over all less dental tissue removal, with promised esthetic rehabilitation.

## Prosthesis Design

A four-unit fixed design partial denture was planned with two modified ridge lap design lateral incisors as pontics connected rigidly with full coverage retainer on 23 and partial coverage retainer involving palatal surface on 21.



Fig. 1: Pretreatment view. Note mesial tilt in canine

The whole prosthesis was planned to be retained with resin bonded cement.

### Tooth Preparation

The 23 was prepared conventionally to receive a full coverage porcelain fused to metal extracoronary retainer with a wide chamfer finish line. Overall 1.5 to 2 mm axial reduction, 2 mm incisal reduction was done, mesial surface of 23 was over prepared to achieve parallelism as it was mesially drifted. The goal was to create a defined path of insertion for the framework, 21 was prepared to receive partial retainer design involving a 0.5 mm lingual reduction of enamel and a 1 mm supragingival reduction extending to the center of the interproximal contact, with an incisal finish line 2 mm short of the incisal edge for optimal esthetics (Fig. 2). Maximum extensions onto the proximal surfaces with proximal grooves were made to enhance resistance for the resin-bonded prosthesis and prevent mesiodistal and faciolingual dislodgment. After tooth preparation, impressions were made by putty wash impression technique using a standard tray and putty and light viscosity vinyl-polysiloxane (Aquasil; Dentsply, Milford, Del.) impression material (Fig. 3). The preparation was provisionally restored with an indirect technique.<sup>3</sup>

### Prosthesis Framework

The fixed prosthesis was fabricated in the laboratory with base metal alloys, due to their enhanced bond to resin cements and ceramic built over this framework with a layering technique. After fabrication of the restoration in the laboratory, the provisional restoration was removed the preparations were cleaned, rinsed and dried. The restoration fit was evaluated with an explorer and a silicone-based material (Fitchchecker; GC America, Chicago, IL). The occlusion was evaluated with articulating paper (Arti-Fol



Fig. 3: Vinyl-polysiloxane impression

BK-25; Bausch KG, Koln, Germany) and adjusted. The esthetics was evaluated visually. Isolation with a rubber dam was performed, followed by luting of the restoration by use of an adhesive technique.<sup>4</sup>

### BONDING

To facilitate cementation, framework and prepared tooth surfaces were air particle abraded with 50 mm aluminum oxide (Microetcher II; Danville Engineering, San Ramon, California). RelyX™ Unicem self-adhesive resin cement was used to lute the frame to the prepared teeth; a thin layer of cement was even applied on the prepared abutments. Framework loaded with the resin cement was fixed on to the prepared abutments and the excess luting agent was removed around the margins with an explorer and interproximal excess using dental floss (Fig. 4).

After this brief initial polymerization to secure the position of the restoration, it was firmly maintained in its definitive position, and polymerized with a 13 mm light guide (Optilux 500; Demetron/Kerr Corp.) for an additional



Fig. 2: Tooth preparation



Fig. 4: Modified resin bonded bridge—Mary Lever



**Figs 5A and B:** Resin bonded: (A) Combination prosthesis, (B) occlusal view

30 seconds through all the restoration aspects. A sharp number 12 scalpel blade was used to shear off the gingival excess of polymerized cement (Figs 5A and B).

## CONCLUSION

Resin-bonded fixed prosthesis can be used successfully in both the anterior and posterior regions of the mouth to replace 1 or 2 missing teeth. However, the survival rate of resin-bonded fixed prosthesis is still considerably less than that of conventional fixed partial dentures. The principle reason for failure is debonding of the framework from the abutment teeth. The use of cantilevered and nonrigid attachments may decrease interabutment forces and reduce debonding of retainers. The selection of nonmobile abutment teeth, preparation designs that enhance retention and resistance form, appropriate alloy selection and metal and tooth bonding technique are critical for success.

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## ABOUT THE AUTHORS

### Venkat Aditya Sunki (Corresponding Author)

Reader, Department of Prosthodontics, Sri Sai College of Dental Surgery, Hyderabad, Andhra Pradesh, India, Phone: 9963670077  
e-mail: adityadent@gmail.com

### Krishna Mohan Reddy

Senior Lecturer, Department of Prosthodontics, Sri Sai College of Dental Surgery, Hyderabad, Andhra Pradesh, India

### CH Vamsi Krishna

Senior Lecturer, Department of Prosthodontics, Sri Sai College of Dental Surgery, Hyderabad, Andhra Pradesh, India

### Nidhi Gupta

Professor, Department of Prosthodontics, Sri Sai College of Dental Surgery, Hyderabad, Andhra Pradesh, India