

## Management of Single Edentulous Space with Resin Bonded Prosthesis: A Case Report and 2 Year Follow-up

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### Abstract

Conventional tooth preparation of abutment teeth often involves removal of significant amount of tooth structure. When the abutment tooth is sound, conventional full coverage procedures seem to be quite radical. More conservative procedures, such as partial veneer crowns or pin-retained restorations, present limitations in esthetics and retention. Many patients object to these drawbacks.

The development of acid etching of enamel to improve the retention of resin, described by Buonocore, in 1955, has proven to be effective in bonding fixed partial dentures to tooth by less destructive means.

The following article presents a series of case reports of treatment of single edentulous space with resin bonded prosthesis.

**Keywords:** Resin bonded prosthesis; Resin cements; Etched cast restorations.

### Introduction

Resin-retained fixed partial dentures rely on adhesive bonding between tooth surface and a resin.[1]

These prostheses have gained considerable popularity since the technique for splinting mandibular anterior teeth was described by Rochette in 1973.[2] The restoration consists of one or more pontics supported by thin metal retainers placed lingually and proximally on the abutment teeth.

Resin-retained FDPs are particularly useful in treating young patients because much less tooth reduction is required than for a conventional retainer design. In addition the resin bonded prostheses are financially more viable as compared to the high cost of

conventional fixed partial dentures. However, problems with long-term retention and esthetic concerns related to darkening of the abutment teeth limit their application.

Three principles are fundamental to achieve predictable results:

- Patient selection,
- Correct enamel modification, and
- Proper framework design.

### Indications[3]

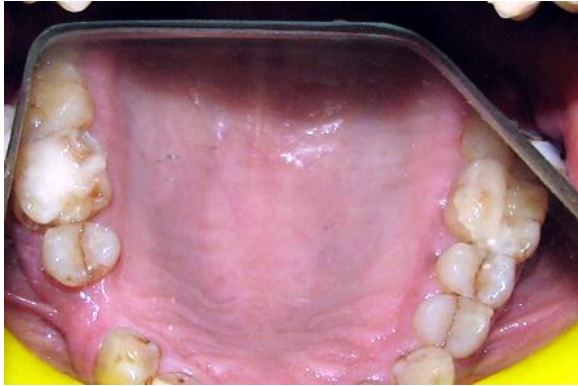
1. As retainers for a fixed partial denture if the abutments provide enough tooth structure for bonding; caries-free abutments or teeth with lesions that do not limit the enamel available for retention are acceptable
2. Periodontal splints
3. Post orthodontic fixed stabilization
4. Innovative applications such as etched inlays and onlays; bonded attachments for removable partial dentures, combined with traditional retainers in a fixed partial denture; and altering tooth morphology for occlusion.

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**Fig 1: Occlusal View of Missing First Premolar****Contraindications[3]**

Bonding is contraindicated if there are

1. abutment teeth with large carious lesions, extensive restorations, or severely abraded teeth;
2. unsightly abutment teeth where esthetics cannot be improved by bonding from the lingual surface; and
3. patients with known sensitivity to nickel or other metals in the nonprecious alloys.

The following case reports present the successful use of resin bonded prostheses with a 2 year follow up in treating a single edentulous space.

**Case 1**

A 42 year old male patient reported to the Out Patient Department of the Department of Prosthodontics with missing maxillary right

**Fig 3: The occlusal view of the completed prosthesis****Fig 2: The completed preparations on the canine and second premolar teeth**

second premolar (Figure 1). The treatment options discussed included implant supported prosthesis, conventional three unit prosthesis, a resin bonded prosthesis, and a removable partial denture.

Taking into consideration the esthetic concerns and financial constraints it was decided to opt for a resin bonded prosthesis and a due consent of the patient was obtained.

The maxillary right canine was prepared on the palatal aspect. A 180° wrap around was incorporated in the design.[3] The preparation was 0.3 - 0.4 mm deep with 2 mm supra gingival finish line. Proximal grooves were incorporated on the mesial and distal aspects. These grooves were placed palatal to the proximal contact. The incisal groove was prepared with an inverted cone diamond point (Shoufu) about 2 mm short of the incisal edge.

**Fig 4: The final prosthesis cemented**

**Fig 5: The edentulous space created by the loss of maxillary left first molar**



The maxillary right second premolar was prepared on the palatal aspect. The finish line and proximal grooves were prepared similar to that of canine. On the occlusal surface an occlusal inlay type rest[4] was prepared about 1.5 mm deep. (Figure 2)

A two step impression was made in addition silicone impression (Aquasil- Dentsply) material was made .

A modified ridge lap design and shade selection was done for the pontic.[5] The prosthesis was completed accordingly. (Figure 3)

The prosthesis was then cemented using resin cement (Panavia). (Figure 4)

#### *Case Report 2*

**Fig 7: Buccal view of the prosthesis cemented**



**Fig 6: The planned design of the prosthesis**



A 23 year old female patient reported with a missing tooth in the maxillary left posterior quadrant. A detailed history revealed the maxillary left second premolar was congenitally missing. The maxillary left first molar was extracted due to caries. Due to the congenitally missing second premolar the first molar had migrated to its place and after it was lost there was space for replacing only a single posterior tooth. (Figure 5)

The first premolar and second molar were prepared. Tooth preparations were restricted to the palatal and proximal axial walls. A single occlusal rest was prepared in the distal triangular fossa of the first premolar. On the occlusal surface of the molar double occlusal rests were prepared on the mesial triangular fossa and on the central groove. (Figure 6)

A modified ridge lap pontic was planned for better esthetics.

Accordingly the prosthesis was completed and cemented with a resin cement. (Figure 7)

**Fig 8: Missing maxillary right lateral incisor**



**Fig 9: Labial view of the bridge cemented***Case Report 3*

A 26 year old male patient reported to the department with a missing maxillary right lateral incisor (Figure 8). The history revealed tooth loss due to caries. After discussing all the available treatment options like a conventional three unit fixed partial denture, a removable partial denture, an implant supported fixed partial denture, and a resin bonded prosthesis, it was decided to design a resin bonded prosthesis.

Accordingly the maxillary right central incisor and canine were prepared to receive the retainers for a resin bonded prosthesis. The preparations were restricted to the palatal aspect of the abutment teeth. The finish lines were 1mm supra gingival and the proximal grooves were palatal to the contact. The incisal grooves were 2mm short of the incisal edge. The preparations were 0.3-0.4 mm deep.

The modified ridge lap pontic design was selected for this case giving due importance to the esthetics. The final prosthesis in place is seen in Figure 9.

In all the three cases the prosthesis was cemented by a resin cement (Panavia 21 Kuraray Co., Osaka, Japan).

Over a 2 year follow up no debonding or patient discomfort was reported. The oral hygiene maintenance was satisfactory. These results compare favourably as compared to that of Thompson.[6]

**Fig 10: The post treatment photograph of the patient****Discussion**

The resin bonded fixed partial denture is a cost effective and satisfactory alternative to the conventional fixed partial denture design.

Full coverage crowns as retainers have advantages and indications, and much has been written about their overuse and periodontal disadvantages. The partial coverage fixed partial denture with inlays, onlays, pin ledges, or three-quarter crowns, are excellent but difficult restorations and require conscientious laboratory support.[3]

If the etched cast restoration can be maintained intraorally for extended periods of time, it should be considered as an alternative treatment.[3]

Adequate attention to the principles of design of the prosthesis can lead to the success of the resin bonded prosthesis even in the posterior aspects of the dental arch.

**Summary**

This article presents a series of case reports of the successful use of resin bonded prosthesis in various regions of the dental arch. Each case was treated on individual basis and all the principles of design of the prosthesis were strictly followed. However one should avoid

indiscriminate over prescription of these type of prostheses in each and every case. A thorough application of knowledge, science and judgement will ultimately lead to clinical success.

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