

Posterior Resin Bonded Fixed Dental Prosthesis

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Abstract

Dentistry is an ever evolving science. With the advancements in the field of bonding techniques and also in the tooth preparation methods, the use of Resin bonded fixed dental prostheses is becoming a treatment of choice for small posterior edentulous spans.

Key words: Resin cement, Maryland Bridge.

Introduction

Resin-bonded fixed partial dentures (RBFDPs) have undergone a lot many changes over the years. Rochette was the first to describe a Resin Bonded Fixed Partial Denture. Initially Resin-bonded fixed partial dentures (RBFDPs) were suggested for replacing small anterior teeth.¹ Later, improvements in the bonding techniques and innovations in the tooth preparation design permitted even posterior teeth replacements using Resin-bonded fixed partial dentures (RBFDPs). To enhance the attachment of the resin cement to the metal surface, macro mechanical retention such as incorporation of a mesh framework, was suggested initially. Later, electrolytic or chemical etching of the casting was used to produce surface micro roughness.

Currently micromechanical retention through air abrasion with aluminum oxide (50-250 µm), as well as the use of a silicoater is used routinely for inducing surface micro roughness of the metal surface. However, silicoated Fixed Partial Dentures (FPDs) must be cemented within 20 minutes of surface treatment for optimal bonding. The design of Resin-bonded fixed partial dentures (RBFDPs) also went through a number of changes². With a minimal preparation or no preparation of the abutments for limited coverage of the abutments, the preparations gradually became more invasive involving proximal grooves and occlusal or lingual rest seats.

Resin cements used for cementation of Resin-bonded fixed partial dentures (RBFDPs) now a days, have superior capabilities of bonding to base metal alloys and bonding to treated or etched dentin. Whenever debonding occur a predominance of enamel-to-resin bond failure rather than metal-to-resin bond failure is noted. However the enamel-to-resin bond strength can be improved with the incorporation of macro mechanical retentive features in the abutment preparation itself to augment the overall bond.

The prognosis of Resin-bonded fixed partial dentures (RBFDPs) has however been less favorable as compared to a conventional Fixed Partial Dentures (FPDs).

The mean survival rate of Resin-bonded fixed partial dentures (RBFDPs) was as follows: 1 year, 89%; 2 years, 84%; 3 years, 80%; and 4 years, 74%.

Case Report

A 24 year old lady reported to the Department of Prosthodontics in Career Post-Graduate Institute of Dental Sciences (CPGIDS) College, Lucknow, India for replacement of missing left maxillary second premolar (tooth number 25), (Fig. 01). After taking all the local and systemic factors into consideration and weighing all the treatment options, a Resin-bonded fixed partial denture (RBFDP) was opted.

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Fig. 01: Pre treatment, Missing tooth number 25.



Fig. 04: Impression of the prepared teeth made with putty wash technique.

Abutment Preparations:

The design of the prosthesis was planned on the diagnostic casts.



Fig. 02: Design of the prosthesis planned on the diagnostic casts. Occlusal rests on 24 and 26 with preparation of the palatal walls along with proximal grooves. An additional occlusal rest was planned on 26.

The casting was designed so that the metal projections from the pontic fit closely into the gingival floors of the occlusal rests. The edentulous space was found to be too wide to accommodate a single premolar and hence the pontic was designed as a molar.



Fig. 05: The completed prosthesis being tried in the patient's mouth.

In addition to the customary proximal and lingual reduction of the abutments, one rest seat was prepared on the occlusal surface of each abutment. Proximal grooves were also prepared (Fig. 02). The facial and lingual walls of these proximal grooves were slightly convergent toward the occlusal surface to provide "undercut retention." An additional rest seat was prepared on the occlusal surface of the molar. The margins of the preparation were kept supragingival³. After impression making in a silicone impression material provisionally restored with Zinc oxide eugenol cement.

The Resin-bonded fixed partial denture (RBFDP) was tried in the mouth (Fig. 05) and the necessary occlusal corrections were made. The metal portion of the intaglio surface was sand blasted before cementation. The cementation was carried out using self cure resin cement. The prepared enamel surfaces and gingival seats were etched with 37% phosphoric acid etchant gel for 20 seconds. Later dentin primer was applied. A mix of two-paste resin cement was made and applied on the fitted surface of the prosthesis, and it was finally cemented into position⁴.

The final esthetic result obtained was as follows (Fig. 06).

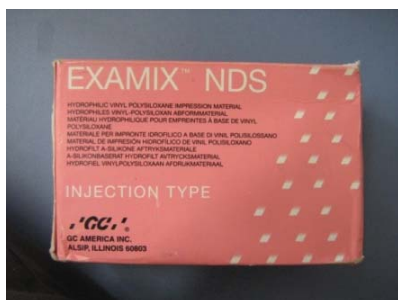


Fig. 03: Addition silicone impression material. Examix NDS (GC-America)



Fig. 06: The prosthesis cemented with a good esthetic result and no display of metal on the buccal side.

Discussion

This design may be slightly more invasive than more traditional methods for preparing the abutments for Resin-bonded fixed partial dentures (RBFDPs). However it remains less invasive and less costly compared with the complete coverage or partial coverage conventional Fixed Partial Dentures (FPDs)⁵. Impression procedures do not require gingival retraction and hence are much simpler. Time for preparation and for provisional restoration is also greatly reduced. However, the cementation procedure is time-consuming and requires strict adherence to the manufacturer's instructions to ensure long-term success.

This modified design for the posterior Resin-bonded fixed partial denture (RBFDP) is best suited for those clinical situations where there is no more than one missing tooth, and when the abutments are either intact or have only small proximal carious lesions or restoration. A formal long term clinical trial is needed to test the long-term performance of this modified design⁶.

Summary

This method involves some modifications in the preparation and casting design. It also requires slightly more time and attention at the cementation procedure.

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