Journal of Applied Dental and Medical Sciences
NLM ID: 101671413 ISSN:2454-2288
Volume 3 Issue3 July-September 2017

Case Report

Posterior Resin Bonded Prosthesis - A Case Report

Darshana Choubisa [1]

[1] *Assistant Professor, Department of Prosthodontics, Pacific Dental College and Research Centre, Udaipur, Rajasthan*

ARTICLE INFO

Keywords:
Posterior Resin-bonded prosthesis (RBP), rest seat, retentive surface, proximal wrap and proximal slots.

ABSTRACT

This article describes a logical tooth preparation approach for posterior abutments to receive posterior resin-bonded prosthesis based on fundamental principles of bridge design which require rigid, accurately fitting frameworks and careful control of the occlusion.

INTRODUCTION

Resin-bonded prosthesis is a fixed dental prosthesis that is luted to tooth structures, primarily enamel, which has been etched to provide mechanical retention for the resin cement.[1] This whimsical approach has become more popular especially for treating the medically compromised, indigent and adolescent patient, as an alternative to conventional fixed and removable partial dentures because the RBPs are economical, conservative and functional and do not irritate soft and hard tissues.[2,3]

In literature it was first introduced by Rochette in 1973, advocated the use of a perforated gold casting through which the resin bonded material passed to achieve a mechanical lock for splinting periodontically weakened mandibular incisors. Later, Howe and Denchy used this technique for an anterior tooth replacement, while Livaditis described using it for posterior tooth replacement. Since then it has undergone substantial development and refinements.[4-10]

Complexity of framework design increases as we approach posterior due to increase in masticatory load, resulting in the transmission of complex shear and tensile stresses to the bonded retainers.[11] The basic framework design to achieve predictable results with posterior resin-bonded prosthesis include - (1) the occlusal rest seat (for resistance to gingival displacement), (2) the retentive surface (for resistance to occlusal displacement), and (3) the proximal wrap and proximal slots (for resistance to torquing forces).[12]

* Corresponding author***: Dr. Darshana Choubisa, Assistant Professor, Department of Prosthodontics, Pacific Dental College and Research Centre, Udaipur, Rajasthan, phone number: 9414723867, Email Add: dr.darshanachoubisa@gmail.com***

Figure - 1: Wax pattern for the posterior RBP

Figure - 2: Completed posterior RBP before cementation

This article describes a logical tooth preparation approach for posterior abutments to receive posterior resin-bonded prosthesis.

CLINICAL REPORT

A 17 year old male patient with a missing mandibular left first molar reported to the Department of Prosthodontics and Crown and Bridge, Mahatma Gandhi Dental College and Hospital, Sitapura, Jaipur, India, with difficulty in chewing food on same side. Intraoral radiograph of mandibular left second premolar and first molar revealed intact enamel with h igh pulp horns and intact lamina dura. The treatment options included an implant supported prosthesis, fixed or removable partial dentures or resin-bonded prosthesis. The patient opted for the resin-bonded prosthesis.

Figure - 3: Occlusal view of completed posterior RBP after cementation

PROCEDURE

Tooth preparation was accomplished according to the basic framework design required for the posterior RBP, consisting 3 major components - (1) Occlusal rest on occlusal surface; (2) minimal reduction of proximal and lingual surfaces and (3) Proximal grooves on each abutment - 35 and 37. Occlusally, the tooth preparation was done in such a manner that the later framework extends high on the cuspal slope well beyond the actual area of enamel recounturing (provided it does not interfere with the occlusion). Care was taken to ensure that the tooth preparation was only in enamel because the bond strength of resin luting agent is more to enamel as compared to dentine. A vinyl polysiloxane impression was made (Aquasil; Dentsply, DeTrey), followed by pouring of the cast (Neelkanth's Dental Stone, Neelkanth Minechem).

The wax pattern for the posterior RBP was fabricated (Figure - 1), invested and casted in a base metal alloys (Bego) (Figure - 2). After trial fitting, air particle abrasion of the metal fitting surface was done and rubber dam was placed. Posterior RBP was cemented using resin cement (3M ESPE Rely X^{TM} U200 self adhesive resin cement; 3M ESPE; USA) (Figure - 3). After cementation, the rubber dam was removed and occlusion was re-evaluated and adjusted as necessary.

Excess cement was removed and post cementation instructions were mentioned to the patient.

DISCUSSION

With the advances in the field of dentistry, various treatment modalities are available to replace missing teeth with further increase in complexity of treatment plan. However, it still remains important to identify a positive "need" to restore a space and to undertake a cost benefit analysis for any proposed restoration - not only in financial terms but also in biological cost to the tooth structure and supporting tissues. Hence, RBP has become a viable option for the long term replacement of missing teeth.[13]

Three principals are fundamental to achieve predictable results with RBP: proper patient selection, correct enamel modification and framework design.[12] Complexity of framework design increases as we proceed posteriorly due to increase masticatory forces, resulting in the transmission of complex shear and tensile stresses to the bonded retainers which further increases functional and retentional demands of RBP. Hence, these stresses can be counteract by including 3 basic components for posterior RBP as mentioned earlier in this article.[11, 12]

Impression procedure was simple, requiring no gingival retraction. In literature, it has been reported that for making final impression, elastomeric impression materials are more desirable and superior as compared to hydrocolloid impression materials.[2]

Sandblasted, non-precious, nickel-chromium alloys were used for framework which offers superior rigidity and mechanical and chemical bonding between the metal and resin based luting cement.[13] In literature, various surface treatment modalities have been mentioned, but it may be selective for each type of base metal alloy, so universal surface treatment of different metals is usually discouraged.[2]

It is always to be remembered that the RBP treatment modality is not a panacea, and if any of the contraindications are present, the patient should be treated with a conventional fixed or removable partial denture or an implant supported prosthesis.

SUMMARY

The prosthetic rehabilitation of small edentulous spans poses a dilemma when the adjacent teeth do not require crown or if patient is not willing to undergo a minor surgical procedure for implants. RBP provide a conservative approach to provide a fixed replacement for small edentulous spans, not compromising the abutment teeth. This is especially important for young patients who may be more likely to experience endodontic complications as a result of extensive tooth preparation. Hence, this case report discussed a technique to fabricate posterior resin bonded prosthesis to rehabilitate small edentulous span created by missing first molar.

REFERENCES

1. The glossary of prosthodontic terms. J Prosthet Dent 2005; 94(1): 10-92.
2. Malone WFP et al. Tylman's Theory and Practice of Fixed Prosthodontics, 8th ed. St Louis: Ishiyaku Euro America; 1989. p. 219 - 28.
3. Dykema RW et al. Johnston's Modern Practice in Fixed Prosthodontics, 4th ed. W. B. Saunders Company; 1986. p. 425 - 29.
4. Rochette AL. Attachment of a splint to enamel of lower anterior teeth.J Prosthet Dent 1973; 30(4): 418–23.
5. Howe DF, Denehy GE. Anterior fixed partial dentures utilizing the acid-etch technique and a cast metal framework. J Prosthet Dent 1977; 37(1): 28–31.
6. Livaditis GJ. Cast metal resin-bonded retainers for posterior teeth. J Am Dent Assoc 1980; 101(6): 926–9.
7. Livaditis GJ, Thompson VP. Etched castings: an improved retentive mechanism for resin-bonded retainers. J Prosthet Dent 1982; 47(1): 52–8.
8. El-Mowafy OM. Posterior resin-bonded fixed partial denture with a modified retentive design: A clinical report. J Prosthet Dent 1998; 80(1): 9–11.
9. Madjar D, Grossmann Y. The design and fabrication of a segmented cast-metal resin-bonded splint. J Prosthet Dent 2003; 90(3): 304–7.
10. Arikan A, Turker SB. The use of a stent-resin-bonded splint combination to stabilize a free gingival autograft. J Prosthet Dent 1999; 81(2): 215–7.
11. Imbery TA, Eshelman EG. Resin-bonded fixed partial dentures: A review of three decades of progress. J Am Dent Assoc 1996; 127(12): 1751–60.
12. Rosenstiel SF, Land MF and Fujimoto J. Contemporary Fixed Prosthodontics, 4th ed. St Louis: Mosby, Inc.; 2006. p. 805-29.
13. Hemmings K, Harrington Z. Replacement of missing teeth with fixed prostheses. Dental Update 2004; 31(3): 137–41.