

# Continuous posterior resin-bonded fixed partial denture incorporated with existing adjacent resin-bonded fixed partial denture: A clinical report

Hiroshi Shimizu, DDS, PhD, and Yutaka Takahashi, DDS, PhD

Division of Removable Prosthodontics, Department of Oral Rehabilitation, Fukuoka Dental College, Fukuoka, Japan

This clinical report describes the procedure to make a continuous anterior-posterior resin-bonded fixed partial denture (RBFPD) incorporated with an existing adjacent posterior RBFPD. A new design was used to make a posterior three-unit silver-palladium-copper-gold alloy RBFPD for a 49-year-old man. Six years after the RBFPD was seated, the tooth next to the RBFPD was extracted. A second three-unit RBFPD made of the same alloy was incorporated with the existing adjacent RBFPD. Consequently, a continuous five-unit RBFPD was created and has been functioning without any problem for more than three years after the seating of the second RBFPD. (Int Chin J Dent 2006; 6: 45-47.)

**Key Words:** adhesive, metal conditioner, resin-bonded fixed partial denture, silver-palladium-copper-gold alloy.

## Introduction

When the tooth next to an existing fixed partial denture is lost, clinicians must remove the denture and then fabricate a new larger denture. Although this conventional method is reliable, it requires a lot of appointments, a long treatment period, a great amount of materials, and the cost is high. The retainers of resin-bonded fixed partial dentures (RBFPDs) cover a narrower area of the abutment teeth compared to conventional full-coverage restorations. In a new type of posterior RBFPDs, the retainers are designed to cover the distolinguobuccal area in the mesial abutment and the mesiolinguobuccal area in the distal abutment.<sup>1</sup> Therefore, the application of this new RBFPD, in which the remaining enamel surface of the abutment tooth is not covered with the retainer, is recommended to eliminate the above problems of the conventional treatment. This clinical report describes the final procedure to complete a continuous RBFPD incorporated with an existing adjacent RBFPD.

## Clinical Report

### Seating of the first RBFPD

A 49-year-old man was seen with the chief complaint of masticatory disturbance resulting from a missing left mandibular first molar. An innovative RBFPD<sup>1</sup> made of a silver-palladium-copper-gold alloy (Castwell M.C. 12, GC Corp., Tokyo, Japan) was seated using a thiouracil metal conditioner for noble metal alloys (Metaltite, Tokuyama Dental Corp., Tokyo, Japan)<sup>2</sup> and an adhesive resin cement (Super-Bond C&B Ivory, Sun Medical Co., Ltd., Moriama, Japan).

### Seating of the second RBFPD incorporated with the first RBFPD

Six years after seating, the patient complained of occlusal pain of the left mandibular first premolar. The first premolar had severe tooth mobility, and an X-ray photograph indicated that there was considerable loss of bone support. Conservative treatment appeared to be impossible. Therefore, the tooth was extracted with his consent. He did not want a single-tooth implant, which would involve surgical treatment along with a single-tooth removable partial denture, and preferred the fixed prosthetic treatment. The left mandibular canine was intact and the left mandibular second premolar was still vital with no caries, although the latter was one of the abutment teeth of the existing posterior RBFPD (Fig. 1). Therefore, the addition of a continuous RBFPD to the

existing RBFDP with minimal vital tooth reduction was proposed, and he chose this treatment option.



**Fig. 1.**



**Fig. 2.**



**Fig. 3.**



**Fig. 4.**



**Fig. 5.**

- Fig. 1.** Missing left mandibular first premolar.  
**Fig. 2.** Master cast showing the preparations.  
**Fig. 3.** Intaglio of the second RBFDP.  
**Fig. 4.** Completed RBFDP incorporated with the existing RBFDP blends well.  
**Fig. 5.** Whole continuous RBFDP has functioned for more than three years.

The lingual and proximal surfaces of the canine were prepared with a horizontal cingulum groove and a combination of opposing vertical grooves<sup>3,4</sup> placed at line angles for mechanical retention. A mesial occlusal rest seat and two vertical grooves at each end of the lingual and buccal surfaces of the second premolar were prepared to avoid reducing the retainer of the existing RBFDP, if possible; however, a small part of the end of the lingual retainer was reduced. A master impression was made, and the master cast was formed using high-strength stone (Fig. 2). The second RBFDP was conventionally fabricated using the same alloy as the first and an indirect composite material (Solidex, Shofu Inc., Kyoto, Japan) (Fig. 3). The second RBFDP was seated (Fig. 4) with the same primer, luting agent, and technique as the existing RBFDP. After seating the RBFDP, the patient followed a regular check-up program. The complete continuous RBFDP has been functioning without any problem for more than three years since the second RBFDP was seated, although the surface of the casting has discolored to some degree (Fig. 5).

## Discussion

The creation of a five-unit anterior-posterior continuous RBFPD by seating a second three-unit RBFPD next to an existing adjacent RBFPD has been described. For cases in which the tooth adjacent to the existing fixed partial dentures is expected to be extracted in the future, the new type of retainer design for posterior RBFPDs should be applicable<sup>1</sup> because the remaining enamel surface of the abutment tooth, which is not covered by the retainer of the existing RBFPD, can be utilized for the retainer of the second RBFPD.

The advantages of this technique are 1) relief of patient's discomfort from dislodgement of the existing RBFPD, 2) fewer appointments, 3) time savings, 4) simplification of laboratory procedures, and 5) a reduction in the amount of materials and costs required. However, a disadvantage is its esthetics because the mesiolinguo buccal area in the premolar is covered, although the retainer is hidden from view by the cheek. If the patient's consent regarding this esthetic problem is not obtained, the procedure should not be used.

Additional retentive preparation forms<sup>3-5</sup> are particularly required when there are pathologically mobile teeth in the abutments, since a long-term follow-up study indicated that mobility of the abutment teeth was one of the decisive prognostic factors for successful resin-bonded prostheses.<sup>6</sup> Finally, V-Primer (Sun Medical Co., Ltd.),<sup>7</sup> one of the thione conditioners for noble metal alloys as well as Metaltite used in the present case, can be used with a silver-palladium-copper-gold alloy.

## Acknowledgment

Editorial assistance by Mrs. Jeanne Santa Cruz is appreciated.

## References

1. Shimizu H, Takahashi Y. Retainer design for posterior resin-bonded fixed partial dentures: A technical report. *Quintessence Int* 2004; 35: 653-4.
2. Matsumura H, Kamada K, Tanoue N, Atsuta M. Effect of thione primers on bonding of noble metal alloys with an adhesive resin. *J Dent* 2000; 28: 287-93.
3. El Salam Shakal MA, Pfeiffer P, Hilgers RD. Effect of tooth preparation design on bond strengths of resin-bonded prostheses: a pilot study. *J Prosthet Dent* 1997; 77: 243-9.
4. Saad AA, Claffey N, Byrne D, Hussey D. Effects of groove placement on retention/resistance of maxillary anterior resin-bonded retainers. *J Prosthet Dent* 1995; 74: 133-9.
5. Shimizu H, Habu T, Yanagida H. Stabilization by splinting of an endodontically treated premolar and a minimally reduced vital canine with a resin-bonded cast retainer: A clinical report. *Int Chin J Dent* 2002; 2: 121-5.
6. Probster B, Henrich GM. 11-year follow-up study of resin-bonded fixed partial dentures. *Int J Prosthodont* 1997; 10: 259-68.
7. Matsumura H, Taira Y, Atsuta M. Adhesive bonding of noble metal alloys with a triazine dithiol derivative primer and an adhesive resin. *J Oral Rehabil* 1999; 26: 877-82.

## Correspondence to:

Dr. Hiroshi Shimizu

Division of Removable Prosthodontics, Department of Oral Rehabilitation, Fukuoka Dental College  
2-15-1, Tamura, Sawaraku, Fukuoka 814-0193, Japan

Fax: +81-92-801-0513 E-mail: simizuh1@college.fdcnet.ac.jp

Received January 24, 2006. Accepted February 26, 2006.

Copyright ©2006 by the *International Chinese Journal of Dentistry*.