Retainer design for posterior resin-bonded fixed partial dentures: A technical report

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This article describes a new posterior preparation and retainer design for resin-bonded fixed partial dentures to resist eccentric loading, using a noble alloy (a silver-palladium-copper-gold alloy), a recently developed metal adhesive conditioner (Metaltite), and an adhesive resin-luting agent (Super-Bond C&B). (Quintessence Int 2004:35:653-654)

Key words: eccentric loading, metal adhesive conditioner, noble alloy, posterior resin-bonded fixed partial denture, preparation, retainer design

Resin-bonded fixed partial dentures (RBFPDs) have recently been accepted as alternatives to conventional fixed partial dentures (FPDs) when intact abutments with minimal tooth substance loss are present. The “Maryland bridge,” which is representative of a nonperforated retainer design, was reported by Livaditis and Thompson and Thompson et al. In this design, a non-noble alloy retainer of the RBFPD covers most of the lingual and proximal area of the posterior abutments. Recently, it was realized that the preparation design should include mechanical retention, eg, grooves for resistance. Chow et al presented a groove, plate, and strut methodical approach, involving minimal preparation of the posterior abutment to receive a RBFPD, using a base metal alloy. Although their design is a conservative and esthetic approach, local anesthesia is generally necessary in order to minimize patient pain while an occlusal strut is prepared to keep adequate retainer thickness, since the enamel layer on premolars and molars is not sufficiently thick (under 0.4 mm).

This article suggests a posterior preparation and retainer design for RBFPDs, to resist eccentric loading of the RBFPDs, which is similar to a glass fiber-reinforced composite RBFPD reported by Vallittu and Svelius using a noble alloy (a silver-palladium-copper-gold alloy, Castwell MC 12, GC), a recently developed metal adhesive conditioner (Metaltite, Tokuyama American), and an adhesive resin-luting agent (Super-Bond C&B ivory, Sun Medical). The modified features of the framework design when compared to the Maryland bridge are the mesiolinguobuccal arm in the molar abutment and the distolinguobuccal arm in the premolar abutment. One thing to note is that local anesthesia is rarely necessary in this preparation procedure.

**TECHNIQUE**

Reduce the proximal surfaces of the intact molar using a tapered round-ended diamond point (BR2, GC) and extend the reduction along the lingual and buccal surfaces of the abutments up to the mesiobuccal groove and lingual groove, respectively. Reduce the intact premolar in a similar manner, provided that it can be determined visually that the end of the buccal reduction area of the abutment is hidden from view by the cheek and that the lingual reduction ends shortly before the distolinguoproximal line angle.

On both of the abutments, prepare occlusal rest seats (1.2 mm deep, 2 mm wide mesiodistally) with a large round diamond point (B41, GC). Define the deepest part of the rest seat in the center of the preparation with a small round diamond point (C40, GC). Make two vertical grooves at each end of the buccal and lingual surfaces of each abutment (0.5 mm deep, 0.5 mm wide) using a tapered flat-ended diamond point (A1, GC).

Make master impressions using silicone elastomeric material (Examix Fine injection/putty type, GC), and form the master cast (Fig 1) using a high-strength stone (Fujirock, GC) with a conventional removable die.

Make master impressions using silicone elastomeric material (Examix Fine injection/putty type, GC), and form the master cast (Fig 1) using a high-strength stone (Fujirock, GC) with a conventional removable die. Make impression and opposing cast. Mount casts in an articulator with the aid of the interocclusal records.
Wax the RBFPD. Sprue, invest, and cast the pattern using a silver-palladium-copper-gold alloy (Castwell MC 12) by means of a conventional centrifugal casting machine, and then polish the framework (Fig 2).

Fit the framework in the patient's oral cavity, and adjust the occlusion.15

Air abrade the intaglio surfaces of the retainers using a grit blaster (Micro Blaster MB102, Conco) with 50-mm grain-sized aluminum oxide (Fig 3). Apply a metal conditioner containing sulfur compounds (Metaltite) to the freshly air-abraded surface with a sponge pellet. Clean the abutment teeth with pumice, and etch with 37% phosphoric acid.

Seat the framework in the mouth with an adhesive luting agent (Super-Bond C&B ivory). When it is set, remove the excess cement (Fig 4).

CONCLUSION

A preparation and retainer design for posterior resin-bonded fixed partial dentures has been described. The use of a modified linguobuccal preparation and retainer design that partially encircles the abutments to resist eccentric loading, and the application of Metaltite to enhance the bonding between the resin and silver-palladium-copper-gold alloy, are suggested. The retainer described in this article has held the abutments firmly for 6 years (at time of writing).

REFERENCES


