

## Clinical Reports

## Alternative restorative approach: A clinical report

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A 26-year-old woman with a history of routine dental treatment was referred for restoration of a missing maxillary right first premolar that had been extracted because of root fracture. The extraction resulted in the loss of the facial plate of bone, which produced a noticeable ridge defect (Fig. 1). The defect was repaired by use of ridge augmentation techniques with the intent of creating an ovate pontic<sup>1</sup> space. The maxillary right first molar had been endodontically treated. In the course of endodontic treatment, a strip perforation of the palatal canal and apex transportation of the mesiofacial root were noted. Subsequent endodontic therapy consisted of obturation of the canal system, mesiofacial apicoectomy, and periodic observation for 1 year for signs of pathosis. After one year the molar was determined to be clinically and radiographically "healed" but was compromised by severe loss of sound clinical crown.

After endodontic consultation a decision was made to restore the maxillary right first molar without a post, the rationale being not to invade the palatal canal space or approach the perforation repair. A coronal-radicular amalgam core, as described by Nayyar et al.<sup>2</sup> (Fig. 2), was placed. This core allowed for the least amount of dentin removal, giving the greatest amount of natural tooth support. A feather-edge finish line was used with the intent of maximizing the amount of remaining tooth structure and providing a 2 mm collar. The tooth was restored with a conventional full-coverage retainer.

The goal of treatment was to replace the missing maxillary right first premolar and restore the maxillary right first molar with the least amount of tooth preparation.

After consultation the patient selected an alternative plan which consisted of restoring the maxillary right first molar as a single unit and replacing the maxillary right first premolar with a pontic that would be connected to the second premolar with a semirigid interlock and to the maxillary right canine using a resin-bonded retainer.

The advent of cast etched-metal, resin-bonded prostheses provides the option of replacing missing teeth with a combination of conventional complete coverage and etched

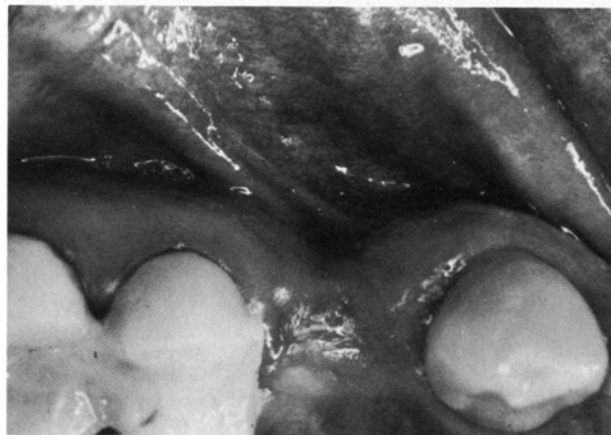


Fig. 1. Resulting ridge condition after extraction of maxillary right first premolar.

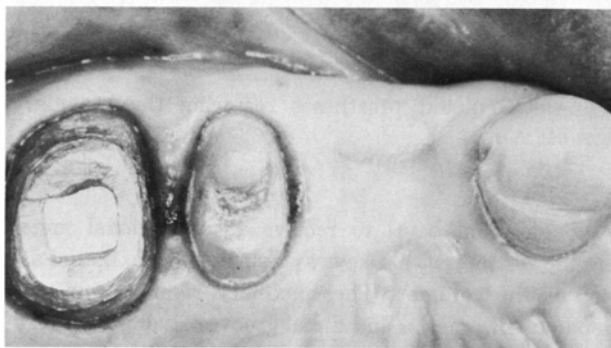


Fig. 2. Tooth preparation for maxillary right segment restorations. Note healed surgical site correcting ridge defect.

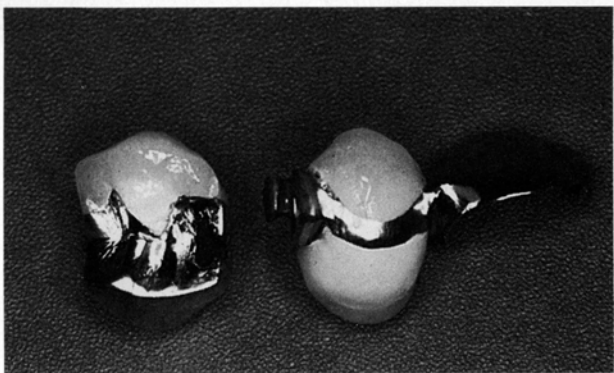
restorations. These can be cast in one piece, cast separately in similar metals to be soldered, or constructed individually of dissimilar metals and connected with a semirigid interlock. The interlock allows for etching (or air abrasion) and bonding of one retainer while conventionally luting the other retainer within the same fixed prosthesis. The success of etched-metal bonded retainers with nonrigid connections has been described by Crispin.<sup>3</sup> The advantages are minimal tooth reduction, improved tooth esthetics, and periodontal compatibility.

The maxillary right second premolar was prepared with

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**Fig. 3.** Three-unit combination prosthesis shows semi-rigid interlock, ovate pontic, and wraparound design of canine retainer.



**Fig. 4.** Completed prostheses restoring the maxillary right segment.

a shoulder and bevel to receive a conventional metal ceramic retainer with a keyway housing on the mesial aspect of the retainer. The maxillary right canine was prepared with mesial and distal grooves, a cingulum rest, and wraparound<sup>4</sup> (180-degree circumferential retention) design to receive an etched cast retainer (Fig. 3). The first premolar pontic, with key on the distal aspect, was waxed and cast with the canine pattern as one unit.

The metal frame of the three-unit, nonrigid connected prosthesis was tried in the mouth, followed by porcelain application in the laboratory. The prosthesis was provisionally luted with zinc oxide and eugenol for 2 weeks. A definitive cementation of the premolar crown was made with polycarboxylate cement. Following cementation the keyway retainer was coated with petroleum jelly, and the etched retainer with key was seated without cement to ensure the proper path of insertion. The canine retainer was then air abraded with 50  $\mu$ m of aluminum oxide particles. The canine isolated by rubber-dam was acid-etched for 45 seconds, rinsed with water, dried, and the retainer luted with Panavia (J. Morita USA Inc., Tustin, Calif.) (Fig. 4).

## ADVANTAGES

1. Reduction of sound tooth structure (canine) is minimal.
2. There is no alteration of tooth structure on the facial surface of the canine.
3. The supragingival margin placement on the palatal surface of the canine creates access for cleaning.
4. Dissimilar metals are used without the unpredictability of soldering.
5. Maintenance of the patient's presently accepted occlusion is not disturbed.
6. The maxillary right first molar is preserved.

## DISADVANTAGES

1. The metals will fatigue at different rates within the interlock, which may lead to uncoupling of the connection over time.
2. The key-keyway system is placed in the mesial aspect of the second premolar, which may lead to unseating on function. The short span of the three-unit prosthesis, however, should reduce the possibility of unseating under function.
3. The cementation procedure becomes more technique-sensitive because of the combination of luting agents.

## SUMMARY

This clinical report describes a technique for restoring a maxillary right posterior segment using a combination of a conventional full-coverage retainer and adhesive resin-bonded retainer with a nonrigid connection, periodontal ridge augmentation, and a coronal-radicular amalgam alloy core. A technique has been outlined that allows for the preservation of the maximum amount of natural tooth structure while restoring a maxillary right posterior segment.

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