The Twin-Flex clasp: an esthetic alternative

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In removable partial denture fabrication, the patient's interest usually lies in the improvement of his or her esthetic appearance. Unsightly facial clasps have always been a cosmetic problem with traditional options either expensive or technically difficult. This article describes an alternative for anterior retention that maintains excellent esthetics with a simple approach. (J Prosthet Dent 1997;77:450-2.)

Changes in dental patients' attitudes and awareness have been apparent in all aspects of dentistry, especially esthetics. This has increased the demand for not just functional care, but esthetically functional care.[1] The esthetic replacement of missing anterior teeth is an integral and viable part of prosthodontics. The preferred method of treatment of the partially edentulous state is a fixed partial denture (FPD). Circumstances such as length of edentulous span, amount of bone loss, abutments with short clinical crowns, or adverse financial considerations may instead require the fabrication of a removable prosthesis. Metal components that are visible when the patient smiles or speaks are a major problem associated with the conventional clasp-type partial denture. Although intracoronal and extracoronal precision attachments may be used, this may require technique-sensitive procedures that may increase the likelihood of introducing clinical and laboratory error.[2]

A conventional clasp-type partial denture that incorporates a rotational path of insertion may be an effective alternative in many esthetically demanding situations.[3-5] The replacement of certain clasp arms by rigid retentive components used in combination with specially designed rests make it possible to eliminate some unesthetic clasp arms. A major disadvantage of the rotational path removable partial denture is that the rigid anterior retentive portion of the framework cannot be adjusted.[6] In addition, Kennedy Class I and Class II removable partial dentures (RPDs) with anterior modification spaces ordinarily do not lend themselves to a rotational path of placement because, the rigid retainers will usually torque the abutments during rotational movements in function.[7]

An alternative for anterior retention that maintains excellent esthetics is the "spring clasp."[8] This consists of a wire clasp soldered into a channel that is cast in the major connector. Because this clasp is flexible instead of rigid, it does not generate as much torque when the distal extension is depressed. The ability to adjust this clasp and its conventional path of insertion provides an excellent design option for retention adjacent to an anterior edentulous segment.

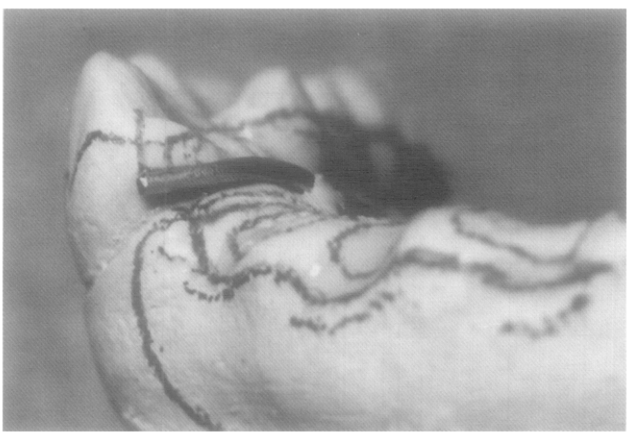

Fig. 1. Wrought wire (19-gauge) positioned in 0.01-inch mesial undercut.

This article describes laboratory procedures for this clasp design, also known as the Twin-Flex technique.[9]

PROCEDURE

1. Place the master cast on the surveyor table at a zero-degree tilt and examine the undercuts with the surveying stylus. Undercuts must be present on all tooth surfaces that are to be contacted by the retentive retainers for this technique to be a viable option.
2. Prepare adequate rests on the abutments to help prevent them from rotating.
3. Adapt a 19-gauge Ticonium round wire (Ticonium Co., New York, N. Y.) into a 0.01 inch undercut on the tooth surface adjacent to the edentulous space in a manner similar to a rotational path design. The wires should be at least 15 mm in length and at least 3 mm away from the free gingival margin of each abutment.
4. After the wires are carefully adapted to the surface of the tooth, hold them in the proper position and flow a slight amount of wax to maintain the wires in place on the teeth (Fig. 1).

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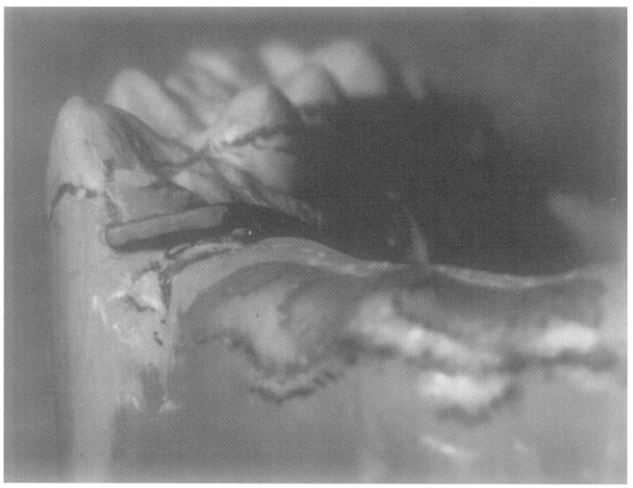

Fig. 2. Additional wax is added to mesial surface of wire to allow horizontal clasp movement in cast framework.

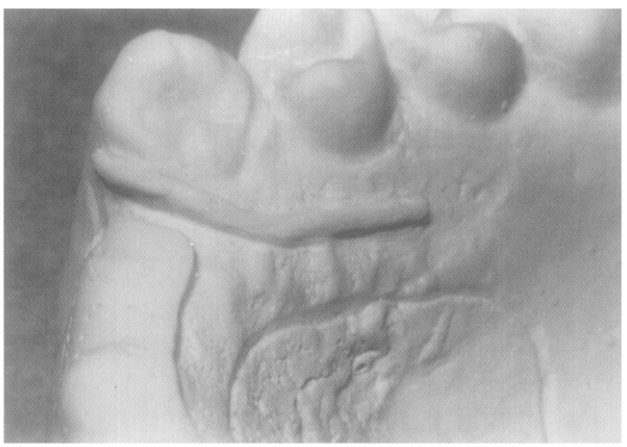

Fig. 3. Blockout is placed along entire wire length to allow ease of its placement in channel to be created in major connector.

5. Block out the rest of cast as for a conventional RPD. Flow an extra layer of wax over the surface of the clasp away from the retentive surface of the tooth (Fig. 2) for the wire to have horizontal movement after the framework is cast.
6. Add additional wax to the wire along its length beneath its height of contour (Fig. 3). (This will facilitate placing the wire in the cast channel in the major connector in Step 11.)
7. Duplicate the master cast with the wire in place and prepare the refractory cast for waxing (Fig. 4).
8. Place 24-gauge sheet wax over the shape of the wire in the investment to allow 2 mm of the tip of the wire to remain uncovered.
9. Finish waxing the remainder of the framework in the normal manner. Invest and cast the framework.
10. Grind and polish the cast framework as usual. After an accurate framework has been confirmed, flush the wax off the master cast with boiling water or steam and clean the wire(s).

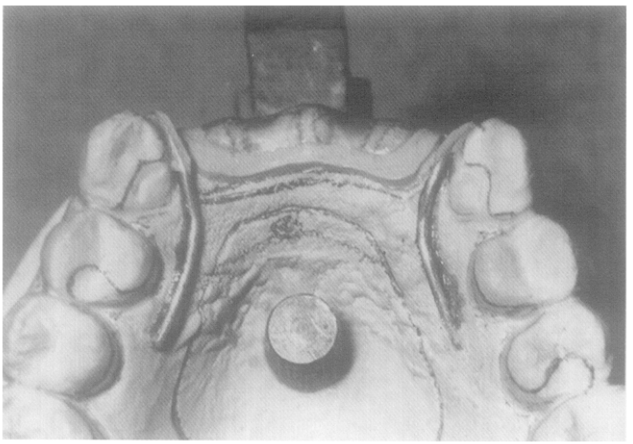

Fig. 4. Refractory investment cast with wire shape duplicated.

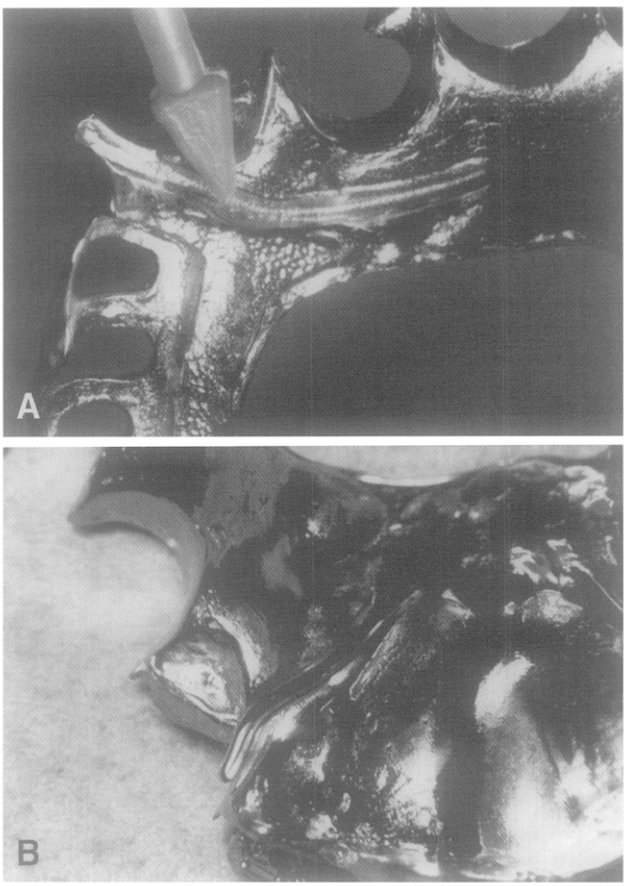

Fig. 5. A, Channel for wire placement in intaglio surface of major connector. **B,** Wire clasp soldered in channel.

11. With the framework off the master cast, place the precontoured wire inside the concave section of the clasp (Fig. 5, *A*). The wire will position itself in the clasp arm. Stabilize and spot-solder the wire clasp in the channel as far away from the retentive tip as possible (Fig. 5, *B*).
12. Refit and complete framework polishing.
13. Adjust the framework in the mouth as any conventional partial denture.

Fig. 6. Example of excellent esthetics provided by Twin-Flex clasp.

Designs using reinforced acrylic resin pontics or other means of achieving predictable anterior esthetics (Fig. 6) work best to ensure the clasp tip remains hidden without compromising replacement tooth contours. To ensure acrylic resin does not flow into the clasp channel during denture base processing and tooth placement, a polyvinyl siloxane material can be used for blockout and then removed after processing. The framework is delivered as any conventional design, with the addition of educating the patient to clean the channel on the intaglio surface of the prosthesis.

DISCUSSION

This article described a procedure using a wrought wire soldered into a channel that is cast into the major connector as an esthetic alternative for anterior retention (Fig. 6). The conventional path of insertion, the ability to use areas of mesial and distal retention that might not be available by traditional clasping, and the ability to adjust the clasp make this design a valuable adjunct in the RPD armamentarium. It is important to remember, as with any clasp assembly, to consider the requirements for proper stabilization with rests and partial encirclement of the abutment to prevent orthodontic movement. Disadvantages of this technique include extra thickness of the major connector over the wire clasp tang, the extra laboratory steps with increased cost, and difficulty in repairing the clasp if breakage occurs.

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Correction

In the article by Ben-Zion Laufer et al., entitled *The effect of marginal thickness on the distortion of different impression materials,* published in the November 1996 issue (volume 76; pages 466-71), there is a product identification error in the Conclusions section, second sentence. The correct material should be "Permlastic," not Permadyne.