A Modified Method of Bonding Lingual Retainers

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Various transfer materials have been proposed for indirect bonding of multistranded stainless steel wire retainers,[1] including silicone-based impression trays,[2] vacuum-formed thermoplastic trays,[3,4] self-curing acrylic trays,[5] and wire-resin trays.[6] Memosil 2* is a transparent addition-cured polyvinyl siloxane elastomer of medium viscosity. Originally designed for bite registration, it has also been used to make transfer trays for indirect, light-cured bonding of orthodontic brackets[7,8] and occlusal templates for light-cured posterior composite restorations. The material is easy to shape and trim and dimensionally stable once it has set (two minutes); moreover, Memosil 2 transfer trays are less costly to fabricate than vacuum-formed thermoplastic transfer trays. In contrast with direct-bonding techniques,[9-13] the Memosil 2 transfer tray ensures that the wire remains passive from fabrication to placement.

This article describes a simplified technique for fabricating an indirectly bonded lingual retainer using a flowable light-cured composite bonding resin** and Memosil 2.

Laboratory Preparation

For good long-term results, a dry field and meticulous technique are essential.

1. After obtaining an impression of the bracketed anterior teeth, cast a plaster working model.
2. Fabricate a 3-3 retainer wire, and secure it to the model with sticky wax at each end (Fig. 1).
3. Mold carving wax over the wire at each tooth to make space for the wells that will be used to hold the adhesive (Fig. 2).

Fig. 1 Adapted retainer wire secured to working cast with sticky wax (brackets removed prior to impression for photographic purposes).

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**Transbond LR, trademark of 3M Unitek, 2724 S. Peck Road, Monrovia, CA, 91016; www.3Munitek.com.

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4. Apply Memosil 2 over the palatal aspects of the teeth and the incisal edges. After coating it with an all-purpose cleansing liquid, smooth the Memosil with a finger to a uniform thickness[1] (Fig. 3).
5. Once the Memosil has hardened, trim it with a sharp scalpel (Fig. 4).
6. Remove the transfer tray, and boil off the carving wax (Fig. 5).

Bonding Procedure

Upper and lower fixed appliances can be left in place throughout the bonding procedure.
1. Isolate the teeth to ensure optimal moisture control with a saliva ejector and cotton rolls.
2. After pumicing the lingual surfaces of the teeth to be bonded for 10-15 seconds, etch them for 30 seconds.[14]
3. Rinse the teeth, and carefully dry them with moisture- and oil-free air. A typical frosting pattern should be seen on the lingual surfaces.
4. Place a small amount of unfilled bonding resin directly on each etched surface, and cure it with a light source for 10 seconds.
5. Carefully place the composite adhesive** into each well of the transfer tray, ensuring that there are no voids at the edges (Fig. 6).
6. Transfer the tray to the patient's mouth, position it against the appropriate teeth, and hold it with gentle finger pressure. Cure the composite occlusolingually for 40 seconds per tooth (Fig. 7).
7. After removing the tray, use a probe to check the tooth-composite interfaces for ledges or voids. If any voids remain, apply additional composite and smooth the surface (Fig. 8).
8. Remove any excess adhesive from the gingival embrasures with a scaler, and trim away any remaining excess composite with an oval tungsten carbide finishing bur No. 7006.***
9. Once the retainer is finished, remove the fixed appliances.

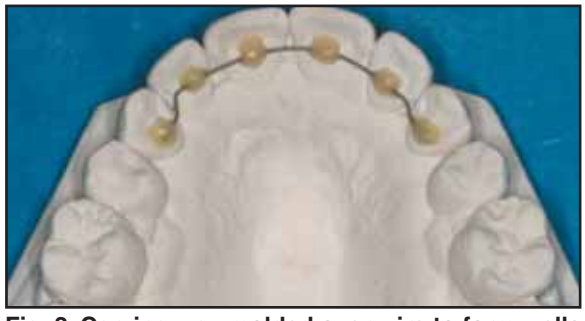

Fig. 2 Carving wax molded over wire to form wells for adhesive.

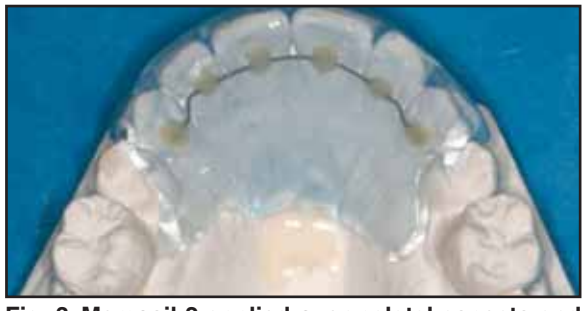

Fig. 3 Memosil 2 applied over palatal aspects and incisal edges of teeth to be bonded.

Fig. 4 Hardened Memosil 2 trimmed to appropriate size.

Fig. 5 Carving wax boiled off, leaving retainer wire in tray.

Conclusion

This modified indirect bonding technique, using a laboratory-prepared Memosil 2 transfer tray, is an accurate, effective, and predictable method for indirectly bonding fixed multistranded wire retainers.

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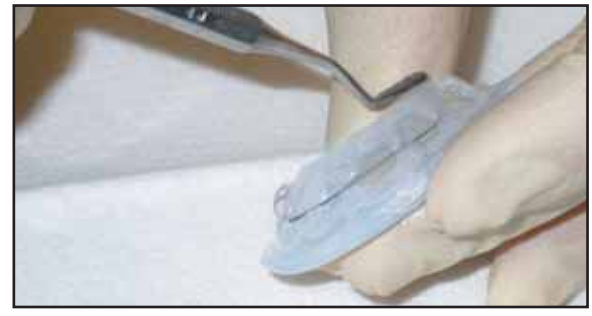

Fig. 6 Composite adhesive placed in transfer tray.

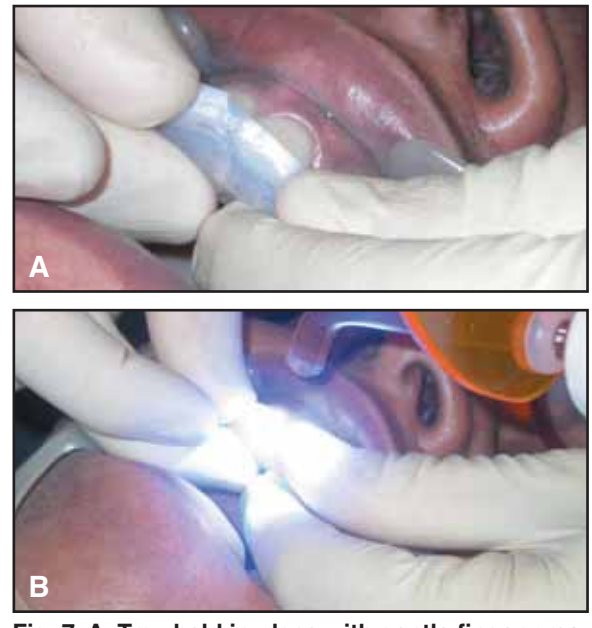

Fig. 7 A. Tray held in place with gentle finger pressure. B. Composite cured using conventional halogen light.

Fig. 8 Finished bonded retainer.