

Indirect Bonding Simplified

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Most indirect bonding techniques are successful in accurately placing brackets,¹⁻¹³ but can be expensive, complex, and time-consuming. This article outlines a simplified method that has considerably reduced laboratory costs and chairtime in my practice, not to mention stress to the orthodontist, staff, and patients.

Procedure

1. Take impressions using a heavy-bodied alginate or polyvinyl siloxane material in metal trays. Pour the casts immediately with a vacuum spatulator and high-quality orthodontic stone,

and let them dry overnight.

2. Mark the long axis of each tooth to be bonded with a sharp pencil, beginning at the midpoint of the occlusal or incisal crown and extending down the facial surface to the gingival margin (Fig. 1). Use the buccal grooves as the long axes of the molars. Indicate any variations in bracket angulation needed for extraction treatment with a superfine red pencil. If crosshatches are routinely used for bracket height determination, they should also be marked at this point with a bracket or Boley gauge.

3. Paint the casts with a liquid foil separating medium, covering the entire crowns and adjacent gingival areas (Fig. 2). Allow about two hours for the liquid to dry completely.

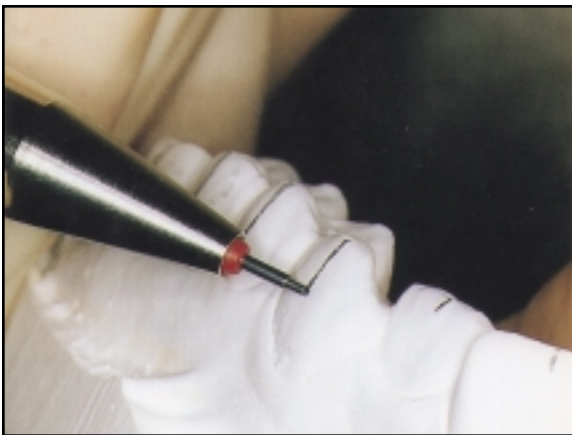


Fig. 1 Long axes of teeth marked on cast.

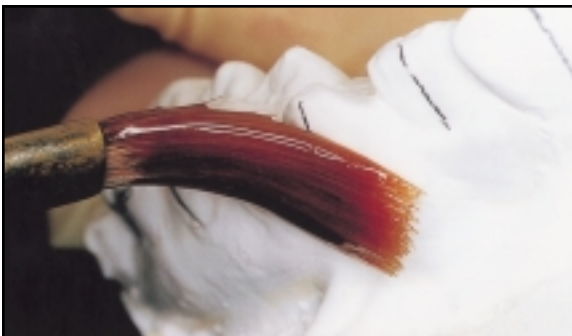


Fig. 2 Application of liquid foil separating medium.

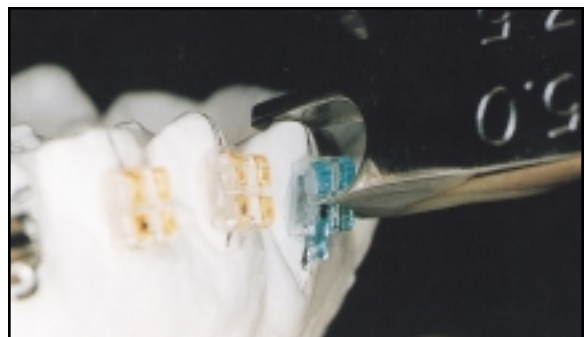


Fig. 3 Brackets pressed firmly in place on cast.



Fig. 4 Adhesive light-cured on cast.



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4. Wipe the bracket bases with methyl ethyl ketone (MEK) or absolute alcohol to remove any contaminants, and allow a few minutes for them to dry. Paint a thin layer of unfilled light-cured resin on each bracket pad, followed by a thin layer of microfilled resin paste (Enlight LV*). Place each bracket in its correct position, using the long axis and the crosshatch lines or a bracket height gauge. Press the bracket firmly against the tooth surface (Fig. 3), and remove any excess adhesive with a scaler or sickle probe.

5. Have an assistant cure the adhesive, using a Demetron Optilux 501* light unit set in boost mode, for 10 seconds each from the occlusal and gingival sides to ensure adequate curing around the bracket pad margins (Fig. 4). Because of incomplete light penetration of the plaster cast, the centers of the custom composite pads will be only partially cured.

6. Inject Memosil CD** polyvinyl siloxane impression material over the brackets and the occlusal and lingual tooth surfaces with the tip of the mixing gun. Sculpt the material to a smooth contour with a finger dipped in detergent or skin

moisturizer, maintaining a minimum thickness of 2mm over the incisal edges and the buccal cusps of the premolars and molars (Fig. 5). If the Memosil CD is stored in a refrigerator, it will be a little more pliable, and its normal three-minute setting time will be slightly extended.

7. Trim the gingival margins of the transfer tray on the cast with a scalpel, or with a scissor or scalpel after the tray has been removed from the cast (Fig. 6). Before gently removing the tray, immerse the cast in water for a few minutes to allow the stone to become saturated and to free the separating medium. The tray can then be sectioned if desired; I have found that the Memosil CD is strong enough to support upper half-sections, but that because of the curvature of the lower incisors, a three-piece lower tray sectioned between the lateral incisors and canines is the most efficient.

8. Etch and prepare the entire dentition as usual. For easier moisture control, I always bond the lower arch before the upper, using cheek retractors and dri-angles to keep the lower buccal segments dry.

9. Blow-dry the teeth to be bonded, and paint the

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Fig. 5 Memosil sculpted with finger dipped in moisturizer to form smooth surface.

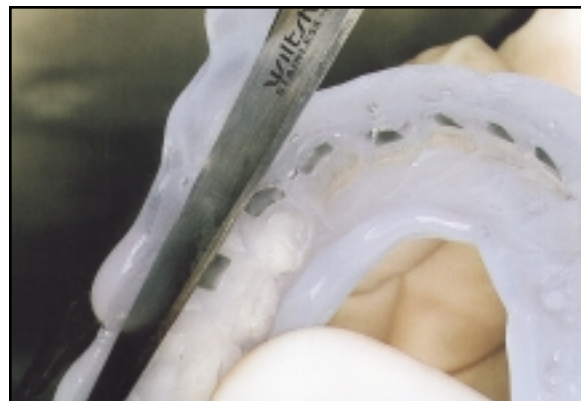


Fig. 6 Transfer tray trimmed with scissor after removal from cast.

tooth surfaces lightly with MEK or absolute alcohol to desiccate the etched enamel. Then blow-dry the teeth again, and apply a thin layer of Orthosolo* (Fig. 7).

10. While the teeth are being prepared, an assistant can wipe the composite pad surfaces in the transfer tray with MEK to ensure that no separating medium or other contaminants remain. A thin layer of Orthosolo is then applied, followed by a very thin layer of Enlight LV (Fig. 8). The Orthosolo brush should be reused to spread the adhesive paste thinly over the entire surface of each bracket pad and thus prevent voids during seating or polymerization (Fig. 9).

11. Seat the indirect transfer tray firmly over the prepared teeth. The Memosil CD adapts so precisely to the tooth surfaces that placement is simple, as long as the transfer tray is extended beyond the gingival margins on the lingual surfaces

*Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867.



Fig. 7 Orthosolo painted on etched enamel surface.

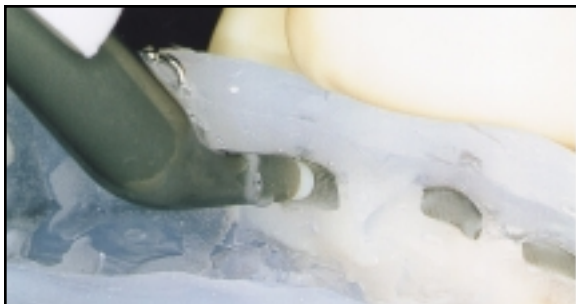


Fig. 8 Enlight LV applied to bracket pad on transfer tray.

and is sufficiently thick on the occlusal and incisal edges to prevent distortion.

12. Cure the adhesive using the Demetron Optilux 501 light in boost mode for 10 seconds on the gingival of each tooth, pressing gently with the black tip inward and gingivally against the bracket in the transfer tray (Fig. 10). For added bond strength, I also cure each bracket from the gingival for five seconds; I have been advised, however, that a second curing is not necessary due to the translucency of the enamel.

13. The transfer tray may be removed immediately after each section is bonded, although waiting until bonding is complete may allow better polymerization of the self-curing phase of the Enlight LV. Remove the tray by gently lifting it from the lingual and rolling it buccally, starting with the most distal bracket and twisting mesially until all the brackets are released (Fig. 11).

14. Little if any flash clean-up is required, and archwires may be placed immediately. This procedure takes 30-35 minutes from prophylaxis to archwire placement, regardless of the size of the mouth or the degree of patient cooperation. Most patients report that bonding is much more comfortable and less time-consuming than they had anticipated.

Discussion

Hickham¹⁴ and Rossouw¹⁵ have stated that an indirect bonding system must satisfy the following criteria to be successful:



Fig. 9 Orthosolo brush used to spread Enlight LV thinly and completely over pad.

- Positions brackets accurately on all teeth.
- Ensures adequate bracket adherence by avoiding moisture contamination.
- Ensures sufficient integrity of transfer trays to hold brackets securely in place while the adhesive polymerizes.
- Reduces stress for the clinical staff.
- Reduces patient discomfort and the duration of the bonding procedure.
- Reduces laboratory expense and doctor chair-time.

In my office, the technique described above has met all these criteria and virtually eliminated failures during bonding, with almost no need for clean-up. Compared to earlier methods of indirect bonding using Optisil or Zantopren transfer trays and various chemically cured resins and

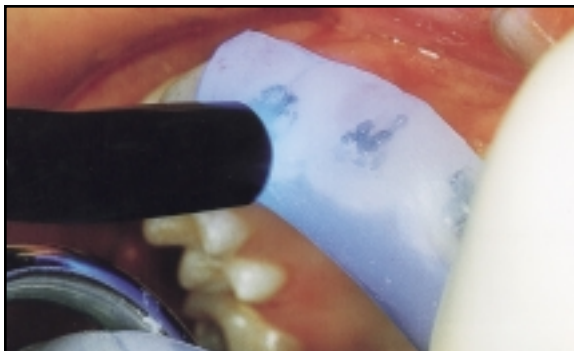


Fig. 10 Bracket bonded with 10-second exposure from occlusal.



Fig. 11 After removal of transfer tray, archwire can be placed immediately.

bonding boosters, this system is simpler, quicker, more efficient, less expensive, and more comfortable for the patients.

Although Read and Pearson have described a similar technique for light-cured bonding with Memosil CD transfer trays,¹⁶ the present method has a simpler bracket placement procedure and takes advantage of recent improvements in adhesives and primers. Mayes has proposed using Enlight LV adhesive with vacuum-formed transfer trays,¹⁷ but I have found the Memosil CD trays to be superior and less complicated to use.

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