

A New Indirect Bonding Technique

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Compared to direct bonding methods, indirect bonding is more accurate and reduces the time spent at the chair. The technique was introduced by Silverman and Cohen in the early 1970s,¹⁻³ but many variations have been developed, using conventional dental composites,⁴ commercial adhesives,⁵ or unconventional adhesives^{6,7} to attach the brackets to the working casts. Most of these adhesives must be removed from

the bracket mesh with running water, an ultrasonic cleanser and acetone, or a toothbrush before the bonding resin is applied and the brackets are bonded to the teeth.⁸⁻¹³ If the adhesive is not completely removed from the mesh, the bond strength may be compromised.

The method illustrated here uses readily available materials and leaves an adhesive-free mesh prior to bonding. The patient shown had a Class II, division 1 malocclusion with mild lower anterior crowding and upper anterior proclination. Brackets were .022" Millennium/PEA* (Roth prescription).

*Lancer Orthodontics, 253 Pawnee St., San Marcos, CA 92069.



Fig. 1 Long axes and bracket slot heights scribed on working cast.

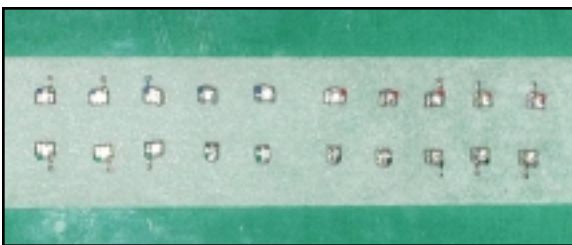


Fig. 2 Brackets affixed to adhesive side of tape by quadrant.



Fig. 3 Tape cut out around each bracket.



Fig. 4 Cyanoacrylate glue applied to non-adhesive side of tape.



Fig. 5 Brackets placed on cast.

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Procedure

1. On the working cast, scribe vertical lines for the long axes of the clinical crowns and horizontal lines for the bracket slot heights (Fig. 1).
2. Spread out a 10mm strip of Micropore** adhesive tape on a glass plate with the adhesive side up. Place the brackets on the tape by quadrant (Fig. 2).
3. Cut out the tape around each bracket (Fig. 3).
4. Apply a drop of cyanoacrylate glue to the non-adhesive side of each piece of Micropore tape (Fig. 4).
5. Affix each bracket to the working cast in its prescribed position (Fig. 5).
6. Place the cast in a vacuum-forming machine, and fabricate a transfer tray using a 2mm soft sheet of BioPlast.† Trim the tray with a scissor, 3mm apical to the gingival margin on all sides.
7. Remove the tray from the cast. The Micropore

tape will adhere to the cast because of the strong bond of the cyanoacrylate glue. The bracket, with adhesive-free mesh, will be embedded within the transfer tray material (Fig. 6).

8. Etch the patient's teeth with 37% phosphoric acid for 15 seconds.

9. Apply a single-paste, resin-based luting agent (Heliosit‡) to the bracket bases.

10. Position the transfer tray in the mouth (Fig. 7), and cure each bracket for 40 seconds (10 seconds on the incisal, 10 seconds on the gingival, and 10 seconds on each side).

11. For easy removal, peel the transfer tray away from the lingual. Check the positions of the bonded brackets (Fig. 8).

**Trademark of 3M, 3M Center, St. Paul, MN 55144.

†Registered trademark of Scheu-Dental, distributed by Great Lakes Orthodontics, Ltd., 199 Fire Tower Drive, Tonawanda, NY 14150.

‡Registered trademark of Ivoclar Vivadent, Inc., 175 Pineview Drive, Amherst, NY 14228.

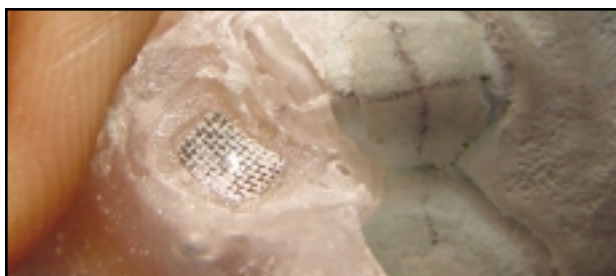


Fig. 6 Brackets with adhesive-free mesh embedded in tray material.



Fig. 7 Tray positioned in mouth.



Fig. 8 Patient after indirect bonding.

Discussion

In our department, this procedure has provided good bond strength under clinical conditions. A full-mouth bonding procedure takes only about 15 minutes.

Any 1st-order discrepancy introduced by the thickness of the Micropore tape and a small drop of low-viscosity cyanoacrylate glue would be minimal and, in any event, would be the same for all the teeth. Because the tape is of uniform thickness and is well adapted to the cast, it will not alter the torque value of the brackets. Furthermore, the adhesive of the Micropore tape does not clog the bracket mesh and therefore does not require a time-consuming cleaning procedure.

REFERENCES

1. Gottlieb, E.L.: JCO Interviews Morton Cohen and Elliott Silverman on indirect bonded practice, *J. Clin. Orthod.* 8:384-405, 1974.
2. Silverman, E. and Cohen, M.: A report on major improvement in the indirect bonding technique, *J. Clin. Orthod.* 9:270-276, 1975.
3. Silverman, E. and Cohen, M.: The twenty-minute full strap up, *J. Clin. Orthod.* 10:764-768, 1976.
4. Thomas, R.G.: Indirect bonding: Simplicity in action, *J. Clin. Orthod.* 13:93-106, 1979.
5. White, L.W.: A new and improved indirect bonding technique, *J. Clin. Orthod.* 33:17-23, 1999.
6. Simmons, M.D.: Improved laboratory procedure for indirect bonding of attachments, *J. Clin. Orthod.* 12:300-302, 1978.
7. Fried, K.H. and Newman, G.V.: Indirect bonding with a no-mix adhesive, *J. Clin. Orthod.* 17:414-419, 1983.
8. Newman, G.V.: Direct and indirect bonding of brackets, *J. Clin. Orthod.* 8:264-272, 1974.
9. Moshiri, F. and Hayward, M.D.: Improved laboratory procedure for indirect bonding, *J. Clin. Orthod.* 13:472-473, 1979.
10. Scholz, R.P.: Indirect bonding revisited, *J. Clin. Orthod.* 17:529-536, 1983.
11. Cooper, R.B. and Sorenson, N.E.: Indirect bonding with Adhesive Precoated Brackets, *J. Clin. Orthod.* 27:164-167, 1993.
12. Hickham, J.H.: Predictable indirect bonding, *J. Clin. Orthod.* 27:215-217, 1993.
13. Moskowitz, E.M.; Knight, L.D.; Sheridan, J.J.; Esmay, T.; and Tovilo, K.: A new look at indirect bonding, *J. Clin. Orthod.* 30:277-281, 1996.