

A Groove-Guided Indirect Transfer System for Lingual Brackets

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Precise bracket placement is even more important in lingual orthodontics than with labial appliances.¹⁻⁵ New bracket systems and more flexible wires have eliminated many positioning problems; examples include Kyung's Mushroom Bracket Positioner,⁵ the STb system* developed by Takemoto and Scuzzo,⁶ Wiechmann's Transfer Optimized Positioning** (TOP), which produces customized archwires with computer-assisted technology, and the Lingualcare bracket system,*** also developed by Wiechmann.⁷

Still, accurate placement of lingual brackets requires an effective method of indirect bonding. The most popular bonding systems can be divided into three major categories:

1. Systems in which the brackets are positioned directly on the patient's pretreatment casts. These include the Torque Angulation Reference Guide† (TARG), the Slot Machine,‡ and the Bond with Equal Specific Thickness†† (BEST) system, later renamed TARG Professional (TARG-Pro).⁸ Although these techniques minimize laboratory and bonding time, they require expensive equipment and do not use setup casts, which can be helpful tools for diagnosis and case presentation.
2. Systems in which the brackets are initially positioned on a setup cast with an ideal archwire, then transferred to the patient's mouth using a minitray for each tooth. These eliminate the step of transferring the brackets back to the initial cast, but increase the time required for bonding.⁸⁻¹⁰
3. Systems in which the brackets are initially positioned on a setup cast, then transferred to the patient's initial cast for fabrication of a transfer tray. This is a simple, effective method that reduces chairtime in bonding, but requires a precise transfer of the brackets from the setup cast to the initial cast.

Prieto and colleagues described such a procedure in 2005, using a red DuraLay‡‡ resin as a guide for the bracket transfer.¹¹ The present article describes a modification of that method that ensures

more precise and reliable indirect bonding. The key improvement is a change in the position of the red DuraLay resin: Instead of being placed at the center of the bracket pad, the resin is applied more incisally or cervically, depending on the tooth, thus freeing the bracket from potential interference (Fig. 1).

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†Registered trademark of Ormco/"A" Company, 1717 W. Collins Ave., Orange, CA 92867; www.ormco.com.

‡Trademark of Creekmore Enterprises, 1620 Fountainview, Houston, TX 77057.

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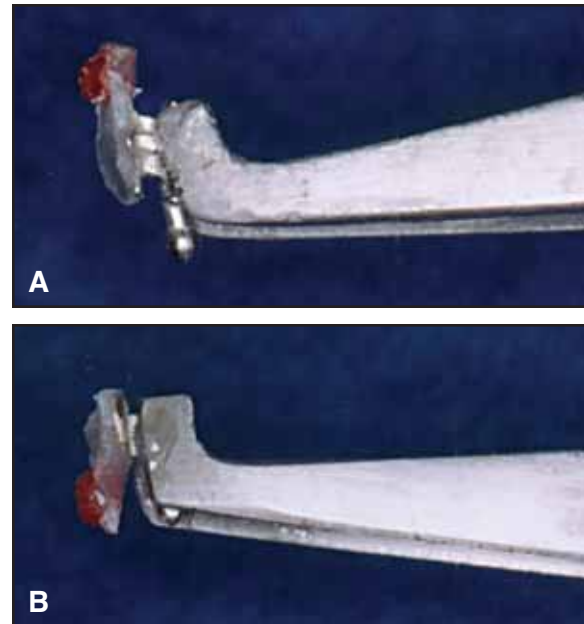


Fig. 1 A. Red DuraLay resin applied more incisally on bracket pad. B. Resin applied more cervically on bracket pad.

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Fig. 2 Grooves carved into lingual surfaces of pre-treatment cast for indirect bracket transfer.

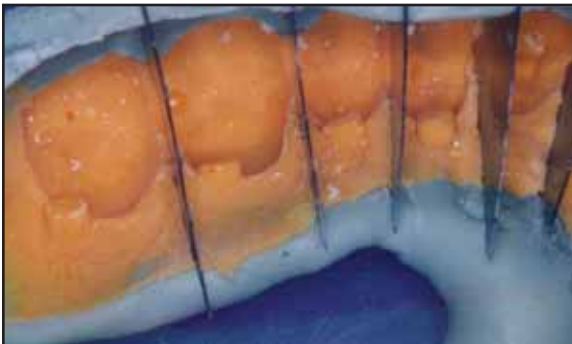
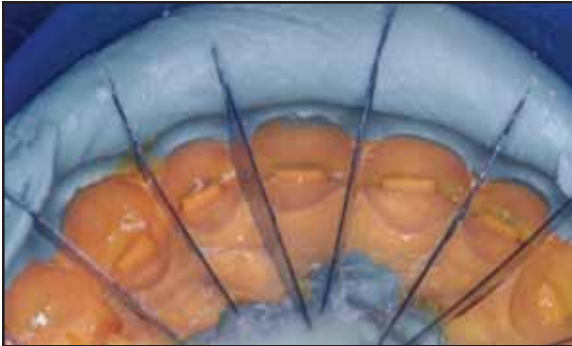


Fig. 3 Lingual grooves filled with soft silicone, tray filled with denser silicone, and teeth separated with x-ray film strips.

§Part No. 1092, KG Sorensen, São Paulo, Brazil.

Groove-Guided Transfer System

U-shaped grooves 2mm wide, 1.5mm high, and 1mm deep are carved into the lingual surfaces of the pretreatment casts with a cylindrical bur§ under irrigation. The grooves in the anterior segments should be carved on the incisal third of the teeth; those in the posterior regions should be carved on the cervical portions of the teeth (Fig. 2). To copy each cast, the grooves are filled in with a softer silicone, and a denser silicone is then poured into the impression tray. After the teeth are separated with x-ray film strips (Fig. 3), a new cast is made. A good copy of the grooves is essential to the accuracy of the transfer process.

The new casts are used for the setup. An .032" archwire is formed over the mandibular cast as a guide (Fig. 4), and the maxillary teeth are then



Fig. 4 Guiding .032" archwire on mandibular cast.



Fig. 5 Maxillary cast articulated over mandibular cast, with individual teeth set up in ideal positions.



Fig. 6 A. Maxillary brackets positioned using .018" x .025" lingual archwire. B. Acrylic resin added to stabilize teeth and archwire.

articulated over the mandibular cast, with the individual teeth moved into ideal positions (Fig. 5).

The lingual brackets are positioned on the setup with the aid of an .018" x .025" lingual archwire (Fig. 6). Acrylic resin may be added occlusal-



Fig. 7 Grooves filled with red DuraLay resin.

ly to stabilize the teeth and archwire during this process. The entire bracket-archwire assembly is then removed, and an acrylic separating medium^{§§} is applied to the lingual surfaces of the teeth, including the grooves. After drying, the grooves are filled with red DuraLay resin (Fig. 7).

The bracket bases are covered with unpolymerized resin and repositioned on the setup cast. The same type of resin is extended over the

DuraLay layer, and the two layers are light-cured together (Fig. 8). The archwire can then be removed; if a bracket accidentally becomes disengaged, it can be repositioned by using its acrylic pad. Next, the individual brackets and pads are removed from the setup cast (Fig. 9).

After the edges of each pad are carefully finished with a bur, the brackets are attached to

the initial cast with sticky wax (Fig. 10). Because the DuraLay resin fits perfectly into the grooves, the pads can be transferred from the setup cast to the initial cast with great precision. A silicone transfer tray is then molded over the

§§Cel-Lac, S.S. White, Senador Alencar, 160, Rio de Janeiro, 20921-430, Brazil.

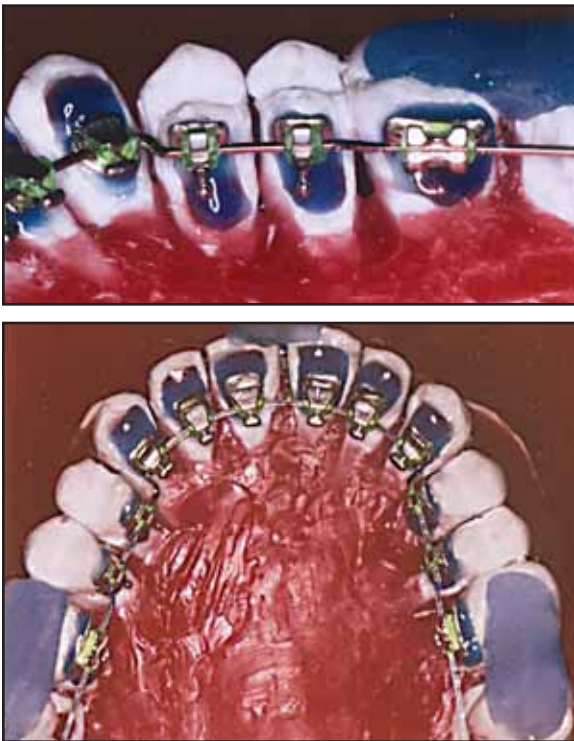


Fig. 8 Bracket bases covered with unpolymerized resin, which is extended to cover DuraLay before resin layers are light-cured together.

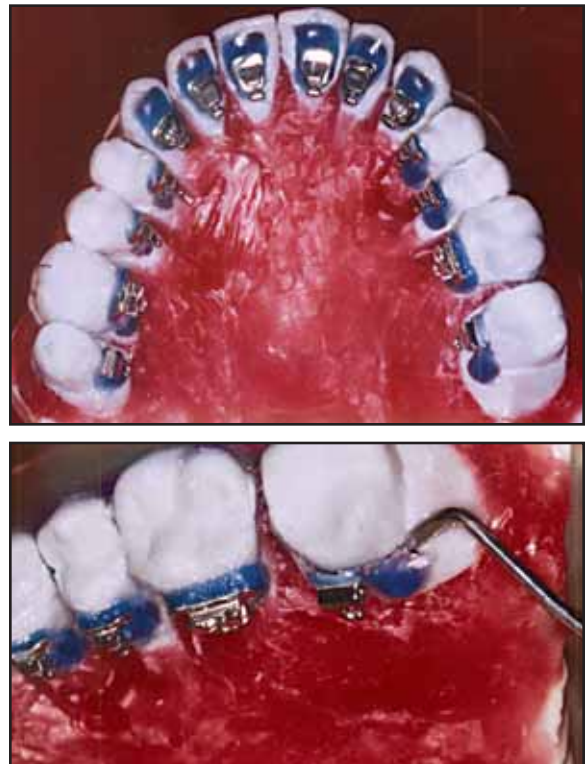


Fig. 9 After removal of archwire, individual brackets are removed from setup cast with explorer.



Fig. 10 Brackets attached to initial cast with sticky wax by fitting DuraLay resin into lingual grooves.



Fig. 11 DuraLay resin removed with bur.

initial cast. After the DuraLay resin is removed with a bur (Fig. 11) and the brackets are cleaned with an acetone solution, they are ready for placement in the patient's mouth (Fig. 12).

Conclusion

The system described here is simple and efficient, offering greater convenience and lower cost than other lingual indirect-bonding techniques. Of course, treatment success depends not only on proper assembly of the appliance, but also on correct diagnosis and bracket positioning.

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Fig. 12 A. Silicone transfer tray ready for use. B. Transfer tray positioned in patient's mouth. C. Lingual appliances in place.