Accurate bracket placement is the key for the successful treatment of an orthodontic case. With indirect bonding, not only is the bracket placement more accurate but this technique also significantly reduces chairtime. In this article, the author explains use of thermal glue in an indirect bonding technique. In cases of constricted arches, a modified rapid maxillary expander can be used along with indirect bonding to reduce overall treatment time. World J Orthod 2006;4:389–393.

The proper positioning of brackets is instrumental to the successful and timely finishing of an orthodontic case. Brackets can be positioned more accurately on the study casts than directly onto the teeth. This becomes even more apparent when the eyes do not cooperate, especially when the clinician wears bifocal lenses; teeth on the left side may get better bracket placement than the teeth on the right. With indirect bonding, not only is the bracket placement more accurate, but this technique also significantly reduces chair time.

Indirect bonding methods usually require a matrix made from vacuum-formed soft and hard overlay resin or silicone impression material. These methods work well, but there is a longer laboratory time involved and they are technique-sensitive. The author uses a low-temperature thermal glue matrix to hold the brackets. The flexibility of this material allows easy removal from teeth after bonding is completed. Any craft glue gun that uses polymer of ethylene vinyl acetate will work for forming the matrix.

TECHNICAL PROCEDURE

When impression records are taken, they are immediately poured with hard dental stone (Denstone, Heraeus Kulzer, Armonk, NY, USA) for the working cast. After the cast is separated from the impression, the same impression is used for the diagnostic study cast. This eliminates the need for a second impression.

If the patient needs maxillary expansion, the casts are used for indirect bonding of the maxillary anterior segment first and are then sent to the laboratory for the construction of the bonded rapid maxillary expander (RME). For patients who need a bonded RME, the entire mandibular arch and maxillary anterior segment is indirect bonded. For patients who need expansion and extraction of the first premolars, the RME will have an occlusal rest or palatal extension on the first premolars and second molars.

The axial midlines are drawn on the teeth of the working cast. A lead gauge is used to scribe horizontal lines for the
bracket placement. A current panoramic radiograph aids in proper bracket placement. After the teeth are marked on the cast, a thin coat of “liquid foil” separating medium, diluted with water in the ratio of 1:1, is applied and casts are allowed to dry.

The dental assistant can place the brackets using any light-cure composite. The orthodontist can quickly review and, if needed, reposition the brackets. In the author’s office, Light Bond (Reliance Orthodontic Products, Itasca, IL, USA) is used. When all the brackets are bonded on the cast, they are cured using a plasma arc light. Alternatively, the bonded cast can be placed in the Triad curing unit (Dentsply, York, PA, USA) for 5 minutes. Chemically cured composite, such as Phase II (Reliance Orthodontic Products), can also be used for indirect bonding. Parts A and B are mixed on treated paper attached to a frozen glass slab and the brackets are bonded with the mix. With this method, the light-curing step is avoided.

A glue gun is used to form the transfer tray. The matrix should be thin and it should cover the entire lingual surface to the gingival margin, the occlusal surface, and the labial surface to the wire slot. The matrix should not cover the gingival wings (Fig 1). Within a few minutes, the glue hardens and the cast is submerged in water for 5 minutes. Brackets are gently separated with a scaler and the matrix is lifted off the cast. The matrix is trimmed with scissors; it is advisable to light-cure from inside. The custom base needs microetching with 50 μm white particles. After rinsing the excess powder, a thin coating of acetone or monomer is applied on the custom base, which makes it receptive to the bonding material (Fig 2). Once the matrix is removed, the same cast is sent to the laboratory for the construction of a bonded expander (Fig 3).

**CLINICAL PROCEDURE**

When the patient returns, the matrix tray is sectioned into 2 or 3 quadrants. After prophylaxis, the bondable surface of the teeth is etched for 30 seconds with 37% phosphoric acid. If the patient is getting a bonded RME at the same time, the buccal and palatal surfaces of the necessary teeth are etched, but it is important not to etch the occlusal surfaces of these teeth. If the teeth do not have chalky appearance after rinsing and drying, they should be etched again for another 15 seconds.

After drying the teeth, a thin layer of moisture-insensitive primer (Assure, Reliance Orthodontic Products) is painted on both the etched enamel and the back of custom base of bracket in the matrix. Assure does not need curing, per the manufacturer, but in the author’s experience, light curing seems to reduce bond failure. Sondhi’s Indirect Rapid-Set
Resin (3M Unitek, Monrovia, CA, USA) can be used for bonding the bracket in the matrix to the teeth. The orthodontist paints a thin layer of Resin A on the tooth surface and the dental assistant paints a thin layer of Resin B on the resin pads in the indirect matrix tray. The custom tray is seated on the lingual side and rolled up onto the labial surface. Firm pressure is applied with the fingers on the occlusal and labial surfaces for 30 seconds to ensure a positive contact between the bracket and the enamel (Fig 4). Before proceeding to the next quadrant, the bracket is pressed firmly against the teeth with a plugger (Fig 5). Two minutes after initial placement, the tray can be peeled from the labial surface with a scaler (Fig 6). Excess flash is easily cleaned up with a scaler and dental floss. The archwire can be placed immediately.

If the patient needs the bonded RME, Excel blue composite (Reliance Orthodontic Products) can be used; this product is chemically cured. After applying the sealant on the etched enamel, mixed composite is placed on the expander and bonded to the teeth. Excess composite should be wiped with a cotton pellet before it dries.

**CASE REPORT**

A patient, 13 years of age, had the chief complaint of “irregular teeth”. He had a narrow maxilla, anterior open bite, and severe crowding of the incisors (Fig 7). Diagnostic study indicated that maxillary expansion would correct the crossbite, and extraction of the 4 first premolars would relieve the anterior crowding. The brackets were placed, with Phase II
(Reliance Orthodontic Products), on the mandibular arch and maxillary anterior segment of the working casts (Fig 8). All first premolars were skipped because they would be extracted after expansion. After removal of the indirect matrix, the bonded rapid palatal expander (RPE) was constructed on the same cast. The bonded RME covered the second premolars and the first molars, with palatal extensions on the second molars and occlusal rests on the first premolars (Fig 9).

The mandibular arch, maxillary incisors, and the RME were bonded at the first appointment (Fig 10). Occlusal rests on the first premolars were covered with light-cured flowable composite. An archwire was not placed in either arch at this visit, but the brackets were covered with elastic modules so that they were not sharp. The patient was instructed to turn the expansion screw twice a day. Within 1 month, the desired expansion was achieved. It is difficult to bond the incisors accurately after expansion because of tipping and the midline diastema. After completion of lateral maxillary expansion, occlusal rests on the maxillary first premolars were cut with an inverted cone bur and the patient was referred for extraction of the first premolars. Heat-activated NiTi archwires were placed in both arches after extraction, and canine retraction was started with light Class I chain elastics (Fig 11). The RME served as an excellent anchorage, and good canine retraction was achieved within 3 months (Fig 12). The RME was debonded 4 months after initial placement and a fixed transpalatal bar was cemented at the same appointment (Fig 13). If needed, distolingual rotation of the maxillary molars with the transpalatal arch can be incorporated for Class II correction. With proper planning, treatment can proceed at a much faster pace. Bonding brackets precisely helps to finish the case well.
Most orthodontists will agree that timely completion of a good orthodontic case depends upon proper placement of brackets. Accurate bracket placement with less bracket repositioning increases the efficiency of orthodontic treatment. The hot-glue matrix offers a reliable method for accurately transferring brackets to the teeth. The custom bases can be easily formed with any composite, and indirect bonding is successfully accomplished using Sondhi’s Rapid Set Resin (3M Unitek). The main advantage of this technique is its dependability and the ability to bond the entire arch in less time.