An Improved Indirect Bonding Tray and Technique


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Abstract

Indirect bonding is becoming more popular as it helps in precise positioning of orthodontic brackets and reduces clinical time needed for bonding. Usually, either a bio-star/vacuum former or rubber based impression material is used for making transfer trays. However, these methods are time-consuming and expensive.

This article presents an improved method of making transfer trays for indirect bonding that saves clinical time, minimizes laboratory time in making the trays and is most economical.

Keywords Indirect Bonding, Glue Gun, Impression Compound

It is a well established fact that indirect bonding helps in precise positioning of the brackets and saves clinical time taken for bonding. Still not many orthodontists regularly use indirect bonding techniques. A number of possible reasons could be: the cost of preparing the trays, the time taken for preparing the trays, an increase in the lab work, the need to train the staff, and inconsistent and unpredictable results.

The most commonly used materials for making indirect bonding trays are either silicon impression material or vacuum-formed resin. These materials are expensive and may need special equipment like a vacuum former which adds to the cost. Another material that has been used is a thermoplastic glue extruded through an electric hot glue gun.1,2 Glue guns are readily available in stationary shops. The glue comes in the form of cylinders of various lengths. A common material for the glue sticks is ethylene-vinyl acetate (EVA) copolymer. It is non-toxic, non-carcinogenic and FDA-approved.1 Preparing a transfer tray with the thermoplastic glue is an economical and quick method. But the trays are not sufficiently rigid during indirect bonding procedures, particularly when full arch indirect bonding has to be done.

We, in our practice have been using a combination of thermoplastic glue (Fig.1A) and impression compound (Fig. 1B) to prepare transfer trays for indirect bonding. The impression compound is a thermoplastic material routinely used in prosthetic procedures. In more than two years of experience with indirect bonding, we have hardly had any bond failures. We use this method for bonding brackets to the labial as well as to the lingual surfaces of teeth.

Procedure

1. Pour cast from alginate impressions.
2. Remove surface irregularities from the cast.
3. Draw vertical and horizontal markings on the teeth with pencil or any lead-tipped gauge. (Fig. 2)
4. Apply separating medium that is routinely used while making acrylic plates on models. Let it dry completely.
5. Take a piece of impression compound and warm it with a flame torch. Place the softened compound onto the occlusal and lingual surfaces

of the teeth. Press and adapt it well. Before it becomes hard take it away from the model and place it again. Do this 2 - 3 times to eliminate any areas of undercut. Let it cool down completely before removing it. Keep it in a box.. The palatal part of the tray is ready.

6. Place the brackets onto the teeth with light cured bonding material on the base. Press them well on to the tooth surfaces. Remove the excess of bonding material around the brackets. Apply light for 10-20 seconds to cure. (Fig. 3 A & B) We prefer to use bands on the first molars instead of bonding tubes. But first and second molar tubes can also be included in the tray.

7. After all the brackets and the tubes are placed, put the part of the tray made in impression compound in its place. (Fig. 4)

8. Flow molten glue from the glue gun and cover the brackets on all the sides. (Fig. 5) Take care that the glue flows only partly under the gingival and occlusal wings of the brackets. If it flows fully then it may be difficult to remove the tray after bonding in the mouth. It helps to use a glue gun with a small nozzle to control the flow of the molten glue. Extend the glue onto the impression compound about 7-8 mm. from the edge. Let the glue cool down for about 5 minutes.

9. Take a probe or a hand scalar and dislodge each bracket and tube from the cast from the gingival aspect. (Fig. 6) Then lift the impression compound and the glue part of the tray alternately to slowly remove the tray from the model. (Fig. 7)

10. Cure any uncured bonding material on the base of the brackets and tubes for 20 seconds. (Fig. 8)

11. Remove the separating medium from the base of the brackets and roughen them by sand blasting. Alternately a small, thin alpine stone may be used for the same. Care has to be taken that not much of the bonding material is removed from the base.

12. Blow air to remove any particles and film of separating medium.

13. Apply bonding agent on the base of the brackets and tubes. (Fig. 9 A) Put a very small quantity of bonding material on the base of the brackets and tubes. (Fig. 9 B)

14. Etch the teeth and apply the bonding agent. Keep a dry field. (Fig. 10)

15. Place the tray in the mouth. Keep the glue part of the tray pressed onto the teeth with fingers and cure through the glue for 20 seconds for each bracket. (Fig. 11)

16. Peel off the glue from the brackets from the gingival side and remove the tray. Cure all the brackets for 10 seconds. Remove any excess of bonding material and polish tooth surfaces if needed. (Fig. 12)

We use this method of making a transfer tray even for a single tooth (Fig. 13) and for a group of teeth as well whenever needed. Tubes can be bonded precisely onto the second molars with these trays when second molars erupt after starting orthodontic treatment or if they have not been bonded earlier. Partial impressions are made of these teeth without removing arch wires and casts are prepared. Transfer trays are prepared the same way as described earlier.

For placing lingual brackets, the impression compound is adapted to the labial and occlusal surfaces of the teeth. (Fig. 14) It is advantageous to make the tray in three parts, particularly for the lower arch. It is easier to maintain a dry field in a smaller area and interference to the path of placement is minimized.

A transfer tray prepared for indirect bonding using the method described here has a number of advantages.

It gives predictable and consistent results.

It saves a lot of clinical as well as laboratory time.

It is easy to fabricate and manipulate.

It is made up of a non-toxic and stable material.

It is very inexpensive.

The materials used are freely available.

The bonding material can be light-cured through the tray.

REFERENCES

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Fig. 1A Glue Gun with Glue Stick

Fig. 1B Impression Compound

Fig. 2 Marking made on the model for bracket positions.

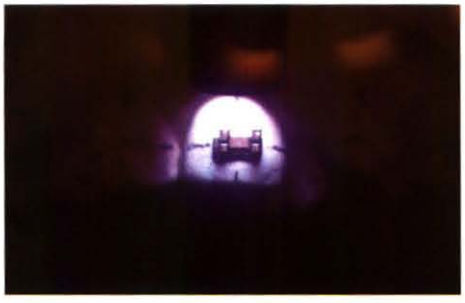

Fig. 3A Bracket place on the model and cured

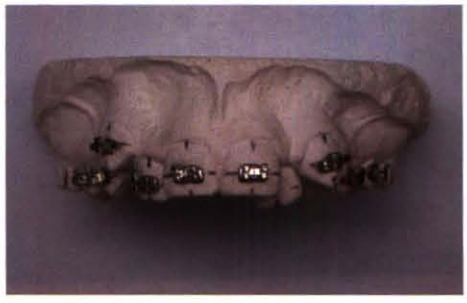

Fig. 3B All brackets placed

Fig. 2 Marking made on the model for bracket positions.

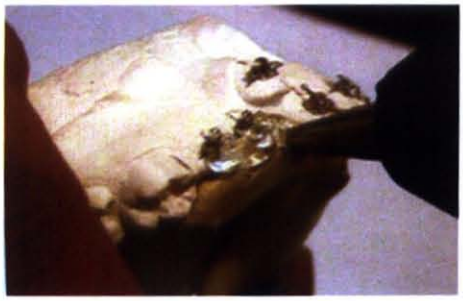

Fig. 5 Glue extruded around the brackets

Fig. 6 Tray removed from the model

Fig. 7 Glue extruded around the brackets

Fig. 8 Tray removed from the model

Fig. 9 Glue extruded around the brackets

Fig. 9B Tray removed from the model

Fig. 9 Glue extruded around the brackets

Fig. 9B Tray removed from the model

Fig. 12 Brackets gransferred to the teeth.

Fig. 13 A, B single tooth tray

Fig. 14 A, B, C Lingual indirect bonding tray.