

## A Newly Simplified Indirect Bonding Technique

### Abstract

Despite the accuracy and clinical time salvage, 90% of orthodontists do not use indirect bonding. Many reasons exist for this choice: materials expense, required laboratory technique, training of personnel, difficulty in achieving consistent and predictable bracket adhesion to the teeth and others. Many clinicians feel that insufficient pressure causes the failure of brackets to bond to teeth with the indirect method. Polyvinylsiloxane and vacuum transfer trays often have excessive flexibility that prevents tight contact between brackets and teeth. Some orthodontists continue to feel that the hot glue transfer tray, does not place sufficient pressure against individual teeth. The indirect bonding system described in this article has the advantage of accuracy and low cost. The technique described is a modification of a method reported by Dr Rajgopal. In this article we have also accessed the accuracy of indirect bonding versus direct bonding technique.

### Key Words

Indirect Bonding , Direct Bonding , Bracket

### Introduction:

In the past, the best clinical results were achieved by Orthodontists who had the best wire bending skills. However, "The best results in the present and in future will be achieved by those orthodontists who are best at accurate bracket positioning"

Because of the increased difficulty in accurate bracket placement in private practise, accurate bracket placement is of the utmost importance and is greatly facilitated by an indirect bonding technique.

The technique was introduced by Silverman and Cohen in the early 1970s,<sup>[1],[2],[3]</sup> but many variations have been developed, using conventional dental composites,<sup>[4]</sup> commercial adhesives,<sup>[5]</sup> or unconventional adhesives<sup>[6],[7]</sup> to attach the bracket to the working cast. In most of the indirect bonding technique the adhesives must be removed from the bracket mesh with running water, an ultrasonic cleaner and acetone, or a tooth brush before the bonding resin is applied and the bracket are bonded to the teeth.<sup>[8],[9],[10],[11],[12],[13]</sup>

The technique described is a modification of a method reported by Dr Rajgopal<sup>[14]</sup>. In this article we have also accessed the accuracy of indirect bonding versus direct bonding technique.

The method illustrated here uses readily available materials and leaves an adhesive free mesh prior to bonding. The

patient shown had a class I bimaxillary protrusion with anterior spacing. Brackets were .022" PEA (MBT PRESCRIPTION). The right quadrant U/L were selected for indirect bonding and left side for direct bonding procedure.

### Procedure

1. Mark vertical and horizontal lines on the working cast for bracket placement. (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. Cut out the tape around each bracket. (Fig 2)
3. Apply a drop of cyanoacrylate glue to the non adhesive side of each piece of micropore tape. (Fig 3)
4. Affix the brackets to the cast in the prescribed position (Fig 4). Gelatin Jigs prepared over brackets for additional retention and to prevent inadvertent debonding during bonding procedure
5. Place the casts in vaccum forming machine and fabricate a transfer tray using 2mm thickness of bioplast. (Fig 5)
6. Remove the tray from the cast. The micropore tape will adhere to the cast because of the strong bond of the glue. The bracket with the adhesive free mesh will be embedded in the transfer tray material. (Fig 6a, 6b)

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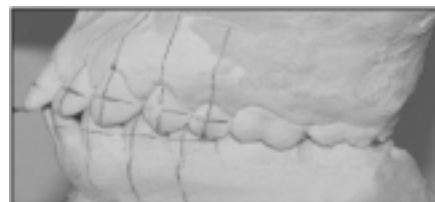


Fig 1: long axes and bracket slot heights scribed on working cast.

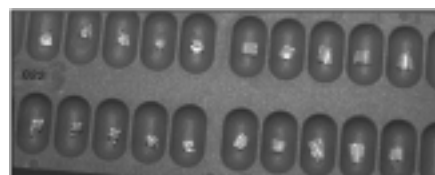


Fig 2: Bracket affixed to adhesive side of tape to right side quadrant and left side without adhesive tape for direct bonding



Fig 3: Bracket affixed with cyanoacrylate glue on the nonadhesive side of tape for bonding

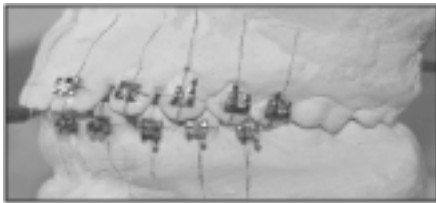


Fig 4: Bracket placed on cast

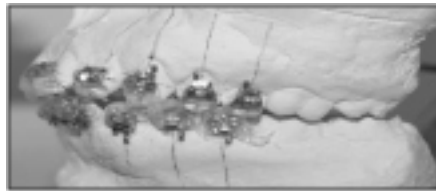


Fig 5: Gelatin Jigs prepared over brackets for additional retention and to prevent inadvertent debonding during tray removal procedure



Fig 6 & 6a: brackets free mesh embedded in tray material



Fig 12: Initial Lateral Cep



Fig 7 & 7a: tray positioned in mouth



Fig 13: Lateral Cep After Debonding



Fig 8: Patient after indirect bonding and direct bonding procedure

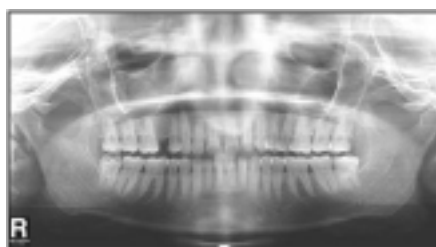


Fig 10: Initial OPG



Fig 9: Patient after debonding procedure



Fig 11: After Debonding OPG

7. Etch the patient teeth with 37% phosphoric acid for 15 seconds.
8. Apply primer over the etched tooth surface and cure it with light cure for 10 seconds (3M transbond primers)
9. Now apply adhesive paste to bracket base and position the transfer trays in the mouth and cure each bracket for 40 seconds (10 seconds on each side) **(fig 7a, 7b)**
10. For easy removal ask patient to gargle with warm water and then give cuts in the interdental area of the transfer tray using scissor and peel the tray from the lingual and check the bracket positions.

The **(Fig 8)** shows patient after indirect bonding and direct bonding procedures and **(Fig 9)** after debonding procedure. The initial OPG and Lateral Cep are shown in **(Fig 10a,10b)** and after

debonding OPG and Lateral Ceph are shown in (Fig 11a, 11b).

#### Discussion:

Comparison of direct with the indirect bonding:

In this study we have done indirect bonding in right quadrants and direct in left quadrants. The treatment results suggest that there is no difference between direct and indirect bonding. In vitro shear bond strength comparison between direct and indirect-bonded attachments showed no significant difference between the two groups<sup>[16]</sup>. Bond strength obtained with Thomas indirect bonding technique was comparable with direct bonding technique. Also the time consuming for indirect bonding is less comparable to direct, with increased patient comfort and good technical and clinical advantages<sup>[15]</sup>. Especially during the first 4 months after brackets placement, this indirect bonding protocol allowed for significant reduction in plaque accumulation around the braces and reduced onset of white spots during the orthodontic treatment<sup>[17]</sup>. Comparisons of the microleakage scores between the direct and the indirect bonding groups at the enamel-composite and composite-bracket interfaces indicated no statistically significant microleakage differences at the gingival and occlusal margins ( $P > 0.05$ ). The type of bonding method (direct versus indirect) did not significantly affect the amount of microleakage at the enamel-composite-bracket complex<sup>[18]</sup>.

#### The advantages of this technique with the technique of those described by Dr Rajgopal

- 1) Individual jigs prepared for each tooth which offers better strength and stability during bonding procedure
- 2) Less chance of debonding during tray removal
- 3) Jigs can later used to rebonding in case of bracket debonding.
- 4) Easy to prepare jigs and cost effective procedure
- 5) Less time consuming
- 6) This procedure can also be used in lingual orthodontic bonding

procedure

#### The discrepancy introduced by the thickness of the micropore tape

First order discrepancy introduced by the thickness of the micropore and a small drop of low - viscosity cyanoacrylate glue would be minimal and, in any event, would be the same thickness and is well adapted to the cast, it will not alter the torque value of the brackets<sup>[14]</sup>. Furthermore, the adhesive of the Micropore tape does not clog the bracket mesh and therefore does not require a time-consuming cleaning procedure.

#### Conclusion:

Indirect bonding is considered to be a useful and efficient approach that improves the results of the treatment. Success with the technique requires attention to detail, but does not require excessive complexity. Thus the above mentioned technique is as simple accurate and cost effective indirect bonding procedure. Continuous improvement in clinical results can be accomplished by assessing finished treatment and by using that knowledge for the benefit of future patients.

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