



Labial/Buccal indirect bonding using the TAD and BPD - Part 3

By Terry Whitty



The Bracket Placement Device (BPD).



The Torque Angulation Device (TAD).

Labial indirect bonding has been around for a long time. Some people love it but some people still have difficulties with it or find it unreliable especially with brackets coming off the teeth at the most inconvenient times. The challenge has not been to get the brackets in the right position because this is easily done on the model; it has really been the transfer of the brackets to the mouth. Will the introduction of new adhesives, this is now much easier and demand for labial indirect bonding is on the increase.

The old laboratory technique known as by “Eye and Hand” is the one generally used by technicians when setting up brackets on plaster models. The doctor or technician marks the long axis lines on the model, and then using a ‘Bracket-positioning Gauge’, marks the height bisecting the axis line for each tooth. The height depends on that required for the individual treatment plan, or follows a recommended bracket positioning chart such as the one by Dr Andrews. Using the gauge eliminates errors in vertical positioning for the “middle of the clinical crown” to a certain degree.

The brackets are then positioned using tweezers so the bracket wings are parallel to the long axis of the tooth. Depending on the method required, the brackets are adhered to the model using a water-soluble adhesive, denture wax or a composite resin. If wax is used, it should be as thin as possible, but this can be easily removed by placing the tray in warm water and then using steam to clean away all residue.

The height is re-checked using the Bracket Positioning Gauge. When all the brackets have been placed on the model and a separating medium painted

onto the occlusal and lingual surface of the teeth, the transfer tray can be pressure formed or various types of silicones can be used. Please see *eLABORATE* Jan/Feb 2008 for more details on this method.

A new technique: Using TAD and BPD technology for improved accuracy

Prepare the models in exactly the same way, but for increased precision check the Horizontal Occlusal Line using the adjustable survey base and the BPD. The Horizontal Occlusal Line as described by Andrews or HOL for short, is the imaginary occlusal plane achieved by taking three reference points. Because we often deal with gross malocclusions, it is often difficult to get the model base parallel with the occlusal plane by using the model trimmer. It is helpful then to measure the first two molars for crown height, add 1mm for under the gingiva and bisect this value from the occlusal edge with a mark. Do the same for the two centrals and then get the average of the two. This gives us three reference points with which to balance on a survey table to the same level. Scribe a line around the model base and grind it back on the trimmer or use a jig to hold the model whilst a new plaster base is made that is parallel to the HOL. This provides a reference point for the bracket positioning procedure.

Once the HOL is determined, you can use a jig to make a new plaster base which is parallel to the HOL.

Using the TAD and the adjustable survey base, we align each tooth according to the prescription for torque and angulation. This is exactly the same method as described in the last issue for the lingual technique.



Figure 1. Lines are drawn on the model as described.



Figure 2. Torque and angulation are referenced with the TAD.

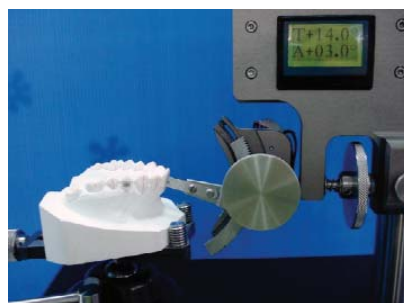


Figure 3. Torque and angulation using TAD. Exact readout via digital display.

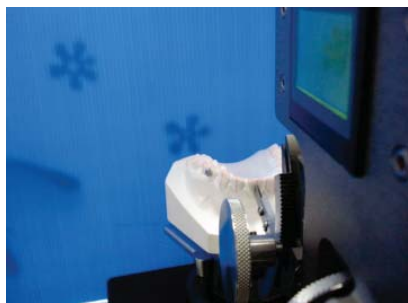


Figure 4. Alternate view of TAD.



Figure 5. Transfer of torque and angulation to the BPD.



Figure 6. Using the BPD to position brackets.



Figure 7. Close-up of BPD.



Figure 8. Brackets are accurately placed using BPD.



Figure 9. Using the BPD for the bicuspid.

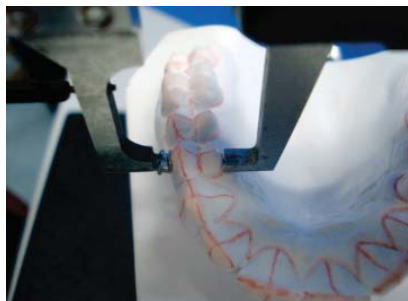


Figure 10. Close-up of bracket position test.



Figure 11. Adding light cure custom base material to bracket (Transbond).



Figure 12. Clean-up the custom base.

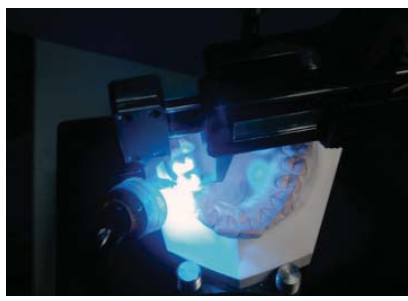


Figure 13. Using hand held light to cure.



Figure 14. Bracket in place.



Figure 15. Completed bracket placement.



Figure 16. Area marked for light cured blackout.



Figure 17. Paint on separator.



Figure 18. Apply light curing blackout.



Figure 19. Blackout to cover incisal edge and occlusal surfaces.



Figure 20. Add tooth number identification.



Figure 21. Adding mechanical retention.



Figure 22. Cure with hand held light while adding retention.



Figure 23. Light cure blackout gives stability to transfer tray.



Figure 24. Memosil Clear Silicone.



Figure 25. Fabrication of silicone transfer tray with Heraeus Memosil.



Figure 26. Use a small amount of detergent and work with fingers. Detergent prevents the Memosil from sticking to your fingers.



Figure 27. Leave for about 10-15 minutes then rinse with cool water.



Figure 28. Use compressed air to ease from model.



Figure 29. Trim tray.



Figure 30. Posterior view.



Figure 31. Trim lingual.



Figure 32. Trimmed transfer tray.



Figure 33. Gently prise from model.

Once the tooth to be bonded has been set in the desired position with relation to torque and angulation and the HOL, then we can transfer over to the BPD for bracket positioning using the horizontal or vertical slot bracket holders.

NOTE: The accuracy of the BPD is 0.01mm and will not move more than 0.02mm whilst bonding the bracket to the model. It will hold the brackets exactly perpendicular to the setting of the TAD.

The bracket is placed in the sprung jaws of the holder and offered up to the model to check the positioning before fixing in place with light cured resin such as 'Tansbond' from 3M ESPE.

Using the light-curing unit, the bracket is fixed and then the procedure repeated for every tooth.

NOTE: The advantages of using a light cured resin pad are mainly that the programming is set into the pad and therefore standard, economic non-programmed edgewise brackets can be used, therefore the accuracy of the slot with regards to the axis can be better controlled, and the Orthodontist does not need to use so much bonding material, thus saving time and money!

Sometimes with under erupted or badly inclined teeth, it can be difficult or impossible to use the TAD and BPD (such as last molars) and it is recommended to use the jig system and/or judgment of the technician.

The transfer tray system is done as described in the pictures using a hard resin key and Memosil silicone.

There are advantages to this system



Figure 34. Removed from the model.



Figure 36. Sandblast gently with 50 micron alumina.



Figure 35. Light cure again from the inside.



Figure 37. Finished tray. Essentially the transfer tray method is similar to the one described in eLABORATE Jan/Feb 2008. Please refer to that article for a more detailed explanation.

over vacuum or pressure forming for the following reasons:

- There seems to be less risk of moving the bracket positions whilst the tray is formed.
- Tray is more stable with its hard resin locator keys for accurate positioning and especially when it is sectioned.
- It can be sectioned down to individual units with ease using a scalpel blade, so therefore re-bonding is easy. Clear vision and numbered teeth all help for ease of placement.

The use of the TAD and the BPD make labial indirect bonding easier and far more accurate than the traditional method and is a great way to learn bracket placement.

Acknowledgement

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About the author

Terry Whitty is the technical editor of eLABORATE and also runs a successful orthodontic laboratory in Sydney's eastern suburbs where he produces innovative appliances using the latest techniques and technologies including laser welding. He has also lectured throughout Australia and New Zealand on a variety of subjects.

For more info on the TAD or BPD, please contact Terry Whitty on (02) 9313-7971.