A RATIONALIZED ORTHODONTIC BONDING TECHNIQUE

Review Article

Pankti Desai* Soniya Parmar Sonali Mahadevia*** Neha Assudani******

ABSTRACT

Bonding in orthodontics is said to be the most fundamental and crucial part. The success of orthodontic treatment enormously depends upon the precision of the bracket placement, which requires greater skills and chairside time. So as to overcome this shortcoming, we have followed a new technique in our department to do indirect bonding, which is done with the help of a glue gun and a transfer tray made up of a bioplast sheet that accounts as the laboratory procedure and the trail on the patient which was efficiently done with precise positioning of the brackets within minimal time. Thereby we can say that this new method is easy, quick and also economic.

Keyword: Indirect bonding, orthodontics, glue gun

Received: 05-03-2018; **Review Completed:** 25-04-2018; **Accepted:** 01-07-2018

INTRODUCTION:

Bonding in orthodontics is said to be the most fundamental and crucial part. The success of orthodontic treatment enormously depends upon precise bracket placement, and thus it is said that the orthodontist with greater skills for bracket placement are more likable to achieve successive treatment results. The concept of indirect bonding was first mentioned in the literature during1970s, and has evolved till date[1-6]as more precise and meticulous technique which allows better three-dimensional visualization of tooth positioning and, as a result, greater accuracy while positioning brackets,[7] also errors associated with bracket positioning were minimized under all the three aspects of observation: height, mesiodistal position and angulation.[8] On the other hand with countable advantages, laboratory procedure and additional cost of the materials limits it usage thus we have demonstrated a new method which is more efficient, simplified and routinely employed in our department with minimum expenses, with the help of glue gun material and a transfer tray made of bioplast sheet.

INDIRECT BONDING TECHNIQUE

All steps involved in indirect bonding are divided into three stages:

1) Clinical Stage I
2) Laboratory Stage
3) Clinical Stage II.

Clinical Stage I

Perform dental prophylaxis, followed by upper and lower full-arch impressions with alginate, examine the impression in detail to ensure that every possible minute detail has been obtained paying special attention to the areas corresponding to teeth in order to avoid potential flaws that may leadto distortions in the dental cast. The dental cast has to be poured with type III dental stone (Orthokal). This procedure should be carried out cautiously so as to avoid any form of imperfections (positive and negative bubbles) as surfaceflaws will hinder brackets and tray fitting to the teeth, when the former are transferred to theoral cavity.

Laboratory Stage

Once the cast have been obtained draw bracket positioning guidelines on the cast with the help of leadpencil. First, determine the long axis of each tooth on the center of its crown, using an OPG as an auxiliary method to observe root angulation. After determining the long axis the height for the bracket placement has to be determined, which is done by selecting the series closest to the predetermined MBT chart series for the particular case, once the series is decided, with the help of MBT gauges the horizontal lines are marked. This procedure has to be repeated for both the casts, the final cast will have a horizontal and vertical lines determining the bracket height and long axis of tooth respectively thus arbitrate the centre of the crown for placement of the brackets.

Subsequently, apply glue with the help of glue gun to the bracket base and position it over the cast surface such as the slot and long axis of brackets lie over the drawn guidelines. Press the bracket over

* PG Student, **PG Student, ***Head of the Department, ****Reader

DEPARTMENT OF ORTHODONTICS AND DENTOFACIALORTHOPAEDICS
AHMEDABAD DENTAL COLLEGE AND HOSPITAL, TA. KALOL, DIST: GANDHINAGAR, GUJARAT, INDIA.

ADDRESS FOR AUTHOR CORROSPONDENCE : DR. PANKTI DESAI, TEL: +919428159869

the pre-established location and remove excess. This procedure has very less working time and thus it has to be done very skilfully once all brackets are placed, positions are to be checked once the bracket positions are satisfactory proceed for the fabrication with the help of a transfer tray using Biostar unit, before fabricating this trays the 1st layer of tray is made by using a vacuumformer over the cast bypolyethylene high density i.e. Isofolan Foil0.1 * 125 mm sheet by Scheu Dental Technology and 2nd layer of thermoplastic polyurethane/polycarbonate i.e.Durasoft pd. 1.5*125 mm a 1.5-mm thick sheet by Scheu Dental Technology. The purpose of these layers is that the hard outer layer provides rigidity to the bonding tray, and the soft inner layer permits easy separation from the brackets. After which excess part of the tray has to be trimmed with carbide burs, it has to be trimmed until the marginal regions of gingiva, such that the trays can be separated from the cast easily. This tray now is to be place in warm water for 1-2 min in order to remove the adhesive and glue from the bracket base. Once the entire tray is being cleaned and excess is trimmed off it to be cut into 3 segments, one anterior and two posterior segments for the ease of handling. The decision to use a single tray for an entire arch, or whether sectional trays are used, is based on the degree of isolation of the teeth that is feasible and crowding, the degree of isolation and ease of tray placement are the determining factors on whether to section the trays or not. If isolation is difficult, the tray may be sectioned at the midline to permit easier bonding.

Clinical Stage II

A thorough prophylaxis using extra-fine pumice is to be done and etch tooth area which has to be bonded, with 37% phosphoric acid for 20 seconds. Wash the etched surface, for additional 20 seconds. A frosty white appearance can be appreciated after this isolate area with cotton rolls and dry thoroughly. Followed by application of primer (Transbond XT Primer adhesive (3M Unitek)) to tooth surface, with the help of applicator tip followed by gentle air spray and then light cure for 15 seconds. Then apply composite (Transbond XT light cure adhesive paste (3M Unitek)) to bracket base andin vitro studies[9,10] have demonstrated satisfactory results when is used for direct orthodontic bonding. After this carefully position the tray over the teeth, while doing this ensure that it has been fitted completely, no excess pressure should be applied to stabilize the tray. After which recheck and confirm the accurate positioning followed by light-curing for 30 seconds on each tooth and if required the curing cycle can be repeated as well. Follow the same procedure for all the remaining segments. Remove the firm tray with the aid of a smooth tip instrument, first pressing to dislodge it towards the occlusal edge. After the tray is completely removed the excess composite material can be removed with the help of scaler tip or bur with very low speed. Once everything is done Orthodontic wires can be inserted immediately.

DISCUSSION

Achieving success with the described technique is not complex, provided attention is paid to the recommended details. It allows precise orthodontic appliance installation in only one appointment, and can be used to place any bracket.[1] The advantages of indirect bonding technique [1 3] includes accuratebracket placement, optimizing the use of doctor's time, avoiding band fitting on posterior teeth thus eliminating the need for separators, improved ability to bond posterior teeth, improved patient comfort and hygiene and simple execution.

Till date many techniques have been evolved for indirect bonding and they have claimed it to be of utmost precision and bond strength, in our technique the key point is to transfer the bracket from cast surface to the transferring tray and as we have also used the Biostar Unit to make the transfer the brackets thus overcoming the drawbacks of use of soft materials which can result not only in imprecision inbracket positioning, but also in high incidence of bond failure as a result of poor fitting.[11] And our technique of fabricating transfer tray is in harmony with the AnupSondhi (2007) technique.

Some of the amendments greatly improve accuracy in bracket placement. The gain in outer tray thickness and boundaries offers improved hardness and stability to the bracket transfer system. At this moment, it is highly recommended that trays be only lightly fitted, without application of additional force to stabilize them, which could cause deviations in ideal bracket positioning. Differences in placement accuracy between right and left sides can arise from non-complianceto this recommendation.[11]

An additional factor contributing to technique efficiency is the clear tray. It not only allows visualconfirmation of fitting and bracket position at the moment of transference, but also permits the use oflight-curable material. The latter provides higher initial bond strength than self-curing materials, anasset at the moment of tray removal and immediate insertion of orthodontic archwires.[12] In addition, itprovides enough time for correct tray fitting,[12] since curing only starts upon activation by the operator.

Other advantage of this technique over other is it uses simple glue to stick the brackets to the cast, which is very cost effective and easy to handle. The glue can be immediately removed from the bracket base under warm water and thus leaving behind clean surface for bonding.

LIMITATIONS:

Some setbacks are present in this technique that is the bond strength of glue which is used is questionable, as a result there can be dislodgment of the bracket, secondly the working time for the glue is very less as it is in molten state which sets immediately and so require precision and skills, and as its bond strength is questionable it can be used as an advantage as well to reposition them. But still the results with this are quite accurate which leads to its efficiency as an orthodontic bonding method, providing the advantages related to indirect bonding to benefit both professionals and patients involved in this process.

FINAL CONSIDERATIONS

The indirect bonding technique is a better method when it comes to precision in placing brackets. However, in order to be successful, the technique must offer sufficient criteria that allow this advantage to be achieved. By judiciously following the steps described herein, it is possible to carry out the procedure with adequate precision and efficiency.[1]

CONCLUSION

Thus, this technique is very simple, yet cost effective while providing the advantage of indirect bonding for both patient and orthodontist as well, thus providing effective and efficient treatment results.

REFERENCES:

1. Thomas R: Indirect bonding: simplicity in action. J ClinOrthod 13:93-106, 1979
2. Moin K, Dogon IL: Indirect bonding of orthodontic attachments. Am J Orthod 72:261-275, 1977
3. Simmons M: Improved laboratory procedure for indirect bonding of attachments. J ClinOrthod 12:300-302, 1978
4. Silverman E, Cohen M: A report on major improvement in the indirect bonding of attachments. J ClinOrthod 9:270-276, 1975
5. Scholz R: Indirect bonding revisited. J ClinOrthod 17:529-536, 1983
6. Moskowitz EM, Knight LD, Sheridan JJ, Esmay T, Kruno T: A new look at indirect bonding. J ClinOrthod 30:277-281, 1996
7. Gorelick L, Masunaga GM, Thomas RG, Zachrisson BU. Round table: bonding. Part 3. J ClinOrthod. 1978;12(12):825-37, 840-2.
8. Hodge TM, Dhopatkar AA, Rock WP, Spary DJ. A randomized clinical trial comparing the accuracy of direct versus indirect bracket placement. J Orthod. 2004;31(2):132-7.
9. Shimizu RH, Grando KG, Shimizu IA, Andriguetto AR, Melo ACM, Witters EL. Assessment of shear bond strength of brackets bonded by direct and indirect techniques: An in vitro study. Dental Press J Orthod. 2012;17(4):23e1-5.
10. Nojima LI, Araújo AS, Rio FM, Naldeman P. Resistênciaadesiva de bráquetesposicionadospelastécnicas de colagemdireta e indireta com diferentessistemasadesivos: estudo in vitro. In: Livro de Resumos da XXXVI Jornada Giulio Massarani de IniciaçãoCientífica, Tecnológica, Artística e Cultural. Rio de Janeiro: Universidade Federal do Rio deJaneiro; 2014. p. 107-8.
11. Castilla AE, Crowe JJ, Moses JR, Wang M, Ferracane JL, Covell DA, Jr. Measurement and comparison of bracket transfer accuracy of five indirect bonding techniques. Angle Orthod. 2014;84(4):607-14.
12. Higgins DW. Indirect bonding with light-cured adhesive and a hybrid transfer tray. SeminOrthod. 2007;13(1):64-8.
13. Sondhi A. Efficient and effective indirect bonding. American journal of orthodontics and dentofacial orthopedics. 1999 Apr 1;115(4):352 9.