An insight into orthodontic indirect bonding technique

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Abstract

Aim: To analyze the advantages and disadvantages of using the technique of indirect bonding.

Materials and Methods: Several articles and publications were taken in account to enlight the benefits and disadvantages of using indirect bonding technique.

Discussions: The indirect bonding technique helps clinicians to position brackets more easily and precisely with a better study of the case and reducing future eventual correction time. In contrast these technique requires an expensive material equipment from dental technician laboratory and specifically commercially designed adhesive primer bonding.

Results: The indirect bonding technique has proven to be equally valid and clinically efficient as the traditionally used direct bonding technique.

Introduction

Historical references: The indirect bonding has been described in detail for the first time in 1975 by Silverman and Cohen. It can be curious to know that initially it was used the famous candy Sugar Daddy, softened with heat, to glue the bracket to the working model. Once the mask was constructed can easily remove the glue and have the basis of the attack ready for bonding. Even today we speak, to indicate this operational methodology of "Sugar Daddy Technique", even if they are used modern water-soluble adhesives. The technique most widely used today is that of the composite coated base attachment, on individualized dental anatomy, created in the laboratory. This technique is called "Custom Base Technique". The first description of this technique is not, however, recent but dates back to 1979, when Thomas, modifying the original technique of Silverman and Cohen described it.

Materials and methods

In order to realize a proper indirect bonding, the first thing to do is take an alginate impression tray, with extreme care and precision, therefore it does not have to show any spatial distortion or bubbles, by pouring and realize the model cast as soon as possible. The model cast must be squared as to maintaining handy dimensions to make it more manageable possible for the operator. Once completely dried, the model cast can be used for brackets positioning.

To make sure that brackets positioning is correct, clinicians score the long axis of the clinical crown of the tooth only from the occlusal and marginal surface to its third gingival and coronal portion remembering to take into account not only the vestibular but also the occlusal / incisal (depending of the tooth in question) surface. It may be useful to mark the center of the clinical crown as a reference point also with the aid of altimeters in order to align on this reference point level, the center of the slot of the bracket. On the bracket back surface a photo-polymerized composite material will then be applied and will be placed at the discretion of the orthodontist. On the next step the construction of the thermoformed template models will be realized in a silicone or vinyl thermoplastic material on the model cast carrying the bonded brackets. The preformed template can then be sectioned into several parts to facilitate the transfer of brackets into the oral cavity. The company ortho-Cadent produces directly transfer templates for indirect bonding, those are realized on the virtual setup once the ideal brackets position is created by the orthodontist. The system was illustrated by Mayhew. Some orthodontists have advised to eliminate undercuts present on templates for example at the level of hooks, fins rotation of the bracket or clip by using wax or silicone material. At this point the model cast, after the last inspection, is ready for next clinical steps. It is interesting to know that they can take up to 30 days before the composite at the bracket's base gets deteriorated with decrease in adhesive-bonding strength. The clinical part of the indirect banding follows the same method of direct banding, once the isolation of the working field is provided, the dental buccal surface will undergo to etching with 37% phosphoric acid and to primer application that will be photo-polymerized for 10 seconds. After that steps procedure, the composite material is applied directly on the previous positioned brackets inside the preformed templates. The templates will be then placed on the surfaces of teeth.
and while holding it in the center, the composite material will complete its polymerization in order to fix the brackets on dental elements, afterwards the templates are removed with great care also a patient's mouth wash rinsing is suggested to help the template's detachment. Any composite excess must be removed carefully with a multi-tungsten carbide cutter. It is best to use small burrs to not ruin metal fins and base of brackets. The procedure will be repeated for all each dental arch sectional areas of the templates (usually the templates is divided into three areas: frontal from canine-canine region- and two lateral posterior areas, thus to improve its correct insertion).

**Discussion and results**

The phases of the laboratory result to be much longer compared to those necessary in the direct bonding. The clinician, however, is able to spend more time in brackets application and accurate tridimensional positioning, given the absence of the patient in the chair, and may also rely on the vision and the study of the inclination of dental roots through orthopanoramic radiography analysis. The technique of indirect banding allows the positioning of the brackets, first on the model cast and then, through the use of preformed templates, it enables the orthodontist to transfer them on the dental elements. The equipment placement on the model cast, provides many advantages: first of all the excellent visibility of teeth inclination, tip and torque parameters that consequently are easier to be corrected through the external bracket positioning on the latter, the possibility of using additional equipment such as altimeters thus ensuring a better ergonomics and the reduction of working time in the patient's oral cavity. The result is a definitely greater precision and accuracy in the management of brackets placement and also the possibility of brackets rebonding without waste of time and patient's distress. Another factor to consider is that of laboratory costs, certainly higher for the use of multiple dental materials. The clinical phase will still be easier for clinicians, since the positioning of the various brackets is immediate, and for the patient that will be less time in the chair and therefore will show a greater compliance.

**Conclusions**

Surely the indirect bonding technique can be proposed as a routine everyday procedure for the easiness of execution and the reduction in clinical working time. It is also important to point out that from the point of view of adhesiveness on dental structures, several studies have seen, in vitro, that there are no substantial differences between the direct versus indirect bonding techniques.

**References**

Illustrations

Illustration 1

Illustration 1. Thermoformed templates on model cast where previously brackets have been temporarily positioned and bonded.

Illustration 2

Illustration 2. Sectioned lateral posterior and frontal area templates.
Illustration 3

Illustration 3. Composite photo polymerization of brackets in the frontal anterior sectional area.