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**Weldable Wire Connector: A New Bracket-Transfer System In Lingual Orthodontics**

**Abstract**

A new method regarding indirect bonding of lingual brackets is presented in this article. This technique makes use of a special aid which is easy-to-construct and which helps facilitate both the transfer tray fabrication and the bracket-transfer procedures in a precise and efficient manner.

**Key words:** Weldable wire connector, transfer wire, wire-resin tray, indirect bonding, lingual orthodontics.

**Introduction**

Transferring lingual brackets from the indirect bonding model to the patients’ teeth is an important and a challenging task. There are various reliable and time-tested transfer systems available for indirect bonding (1-3). In order to simplify the fabrication of transfer trays, some of the manufacturers have created special accessories with their bracket system such as, smart jig in Evolution bracket (Adenta GmH, Gilching, Germany) and set-up wire in 3D torque lingual bracket (Forestandent). Since such accessories are not available with every lingual bracket system, we have created a new aid called Weldable Wire Connector (WWC) that can work well with most of the commercially available bracket systems. This aid has been evolved by incorporating ideas from other techniques (4-6) that utilize transfer wires to fabricate the wire-resin transfer trays. In fabricating such transfer trays, the use of a full-size rectangular transfer wire is desirable as it results in precise indirect bonding of brackets. But this makes the separation of trays from the brackets a time consuming job. For example, in Arima’s Transferring Master Mold (6), a full-slot .018-inch x .025-inch stainless steel transfer wire is used for fabricating wire-resin transfer trays. In this technique, separating the tray from the bonded bracket requires two steps. First the resin part of the transfer tray is removed and then the transfer wire is released from the slot. This article describes how WWC helps disconnect the transfer trays in a simpler manner and helps fabricate individual wire-resin transfer trays that are reusable, stable and accurate.

**Laboratory Procedure**

1. Take a 10-15mm of straight length of .017”x.025” Beta-titanium wire (Remaiant special, Dentaurum) and on its one end give a small 90° bend (Fig.01A). Take another piece of .018” x .025” Remaiant wire which is about 5mm in length (Fig.01A) and weld the former piece of wire on one of its ends. This L-shaped assembly is called a WWC (Fig.01-B). For proper welding, it is important to carefully calibrate the spot welder (7-9).
2. Prepare the indirect bonding model and then position and bond brackets to the cast. Figure 2 shows Evolution brackets positioned with the Hiro System (10-12). However, this transfer system allows use of any bracket positioning system.

3. Ligate WWCs in the bracket slots by keeping their weld joints distal to the brackets (Fig.03). Order of positioning can be reversed according to the case keeping in view the position of the particular tooth (misaligned) in the malocclusion model. Cut the protruding wires extending from mesial of the brackets if any.

4. Bend WWCs over the incisal edges / occlusal surfaces of the teeth (Fig.03).

After all the connectors are bent, put light-cured Tiger Bond Band Cement (Class One Orthodontics, Lubbock, TX) onto each connector and tooth in the following manner:
- In posterior teeth, cover only the occlusal surface.
- In anterior teeth, cover the incisal edge and some part of the labial surface. Light cure the cement in order to complete the transfer tray fabrication process (Fig.04). This selective coverage of tooth surfaces will later on facilitate easy separation of the transfer tray from the bonded bracket.

5. Gently remove all the transfer tray-bracket assemblies from the model and with help of a fine stone remove the resin flash from around the customized bracketed pads.

6. With the help of a Microetcher (Danville Materials, San Ramon, CA) gently microetch the customized bracket pads with 50 Micron Aluminium Oxide for 2-3 seconds. Bracket pads are rinsed and dried, and then these customized brackets are stored in a bracket case.

Fig. 01(A). The Vertical and horizontal parts of the WWC before welding. (B). The weldable wire connector.

Fig. 02. The Hiro System of bracket positioning.

Fig. 03. The WWCs are seen ligated to the brackets. The arrow shows the bent WWC.

Fig. 04. Single-tooth transfer tray for each bracket.

Fig. 05. Bonding of brackets in the mouth.
Clinical Procedure

1. After the lingual surfaces of teeth are etched, rinsed and dried, apply bonding agent like Orthosolo (Ormco) to the lingual surface of the tooth and the corresponding bracket pad. Also apply small amount of Enlight (Ormco) on the bracket pad and position the transfer tray-bracket assembly on the corresponding tooth and polymerize the resin with a curing light (Fig.05). The same procedure is repeated on every tooth.

2. In order to disconnect the transfer tray from the bracket, release the wire from the slot. Since the wire in the bracket slot is a full-size rectangular wire, it is important to first lift the transfer tray by applying a mild tipping force in a labio-lingual direction (Fig.06a) and then simultaneously displace the transfer tray in the lingual direction (Fig.06b). This will tease out the wire from the slot. During this process, the tray gets disconnected from the bracket in a safe manner without causing any damage to either of the two, because of the superior springback properties of the Beta-titanium wire (13).

Beta-titanium wire is no doubt less rigid than the stainless steel wire but its use in the fabrication of a WWC offers sufficient rigidity to the transfer tray to accomplish the indirect bonding procedures in a reliable and accurate manner.

Key Benefits:

1. Transfer trays are reusable and stable.

2. Trays can be easily positioned on the teeth and once the bonding is accomplished they can be quickly disconnected from their respective brackets, resulting in reduced chair-time.

3. Since trays are made up of wire-resin combination, complete brackets are visible during the bonding procedures enabling any flash to be easily removed before polymerization of the adhesive.

4. Both self-cured and light-cured adhesives can be used for bonding and rebonding of brackets.

Discussion

The special combination of beta-titanium wires used in constructing the WWC allows for the use of a full-size rectangular wire in the bracket slot and at the same time imparts sufficient flexibility to the transfer tray so that it can be quickly disconnected from the bonded bracket in a single step.

Fig. 06. Separating transfer tray from the bracket. (a) Support the bracket with a finger and gently lift (tip) the resin part of the tray. (b) Displace the tray in lingual direction by rotating it mesio-apically.
References:


