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Short Communication

Precision-brace positioner (A modified bracket holding tweezer)

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ABSTRACT

The process of orthodontic bonding should be accurate for excellent clinical outcome. For clinicians and postgraduate residents, accurately determining the center of the clinical crown—where the bracket should ideally be placed to express the built-in prescription—poses a challenge. Typically, gauges are used to place the bracket accurately both in horizontal and vertical plane of space. In an effort to streamline the bonding procedure and eliminate the need for drawing lines on the teeth, we have enhanced the bracket-holding tweezer. This modification involves incorporating a diode laser, aiming to simplify the assessment of the clinical crown's center for clinicians, ultimately contributing to a more precise bonding procedure.

1. Introduction

In the past, orthodontists relied on their skills as wire benders, but contemporary orthodontics demands precision in bracket placement. Any initial inaccuracies in bracket positioning persist throughout the entire treatment, leading to in-out discrepancies, tip loss, and incomplete torque expression. The facial axis point (Andrew's plane)' [1] was traditionally chosen for bracket placement due to its consistent location, as noted by various researchers, including Ricketts [2] and Kalange. [3]

Ronald Roth introduced the second generation of brackets, modifying Andrews's prescription and using the canine and premolar as references for bracket height positioning. McLaughlin et al. [4] emphasized the importance of accurate bracket positioning to fully utilize the bracket system's features. They recommended specific vertical positions for brackets based on tooth size. The MBT gauge, developed by McLaughlin, Bennett, and Trevisi, became instrumental in achieving precise bracket height.

Gauges, such as Star-shaped or Boone's gauge and straight rod-shaped or Dougherty gauges, play a crucial role in vertical alignment of brackets. While they enhance precision in occluso-gingival positioning, they do not address horizontal bracket positioning. The angle of gauge placement influences the bracket's height, with variations impacting torque expression and the Smile arc.

Despite numerous gauge modifications, there is no universal bracket placing plier that caters to all teeth, allowing for precise centering of brackets on the clinical crown. Such a tool would streamline the bonding procedure, reduce chairside time, and facilitate ease of crown centre assessment for clinicians.

In 1999, Kalange presented a technique using vertical and horizontal reference lines on working models for bracket placement based on level marginal ridges, functional occlusal contacts, and aesthetic surfaces. [3] Reichheld and co-workers used individual preformed height gauges to position the brackets on the working models reducing bracket placement errors.

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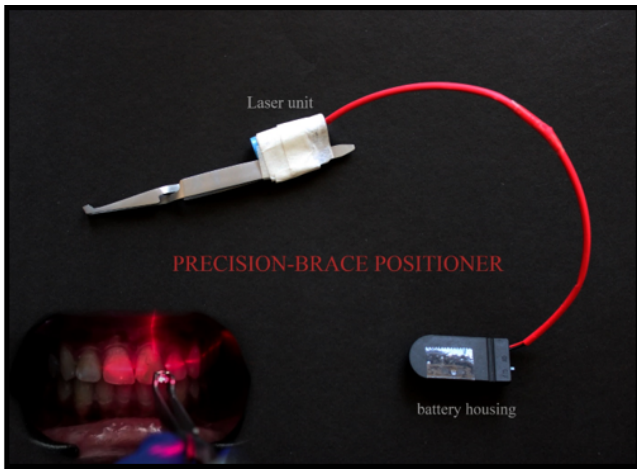

Figure 1: Precision-brace positioner

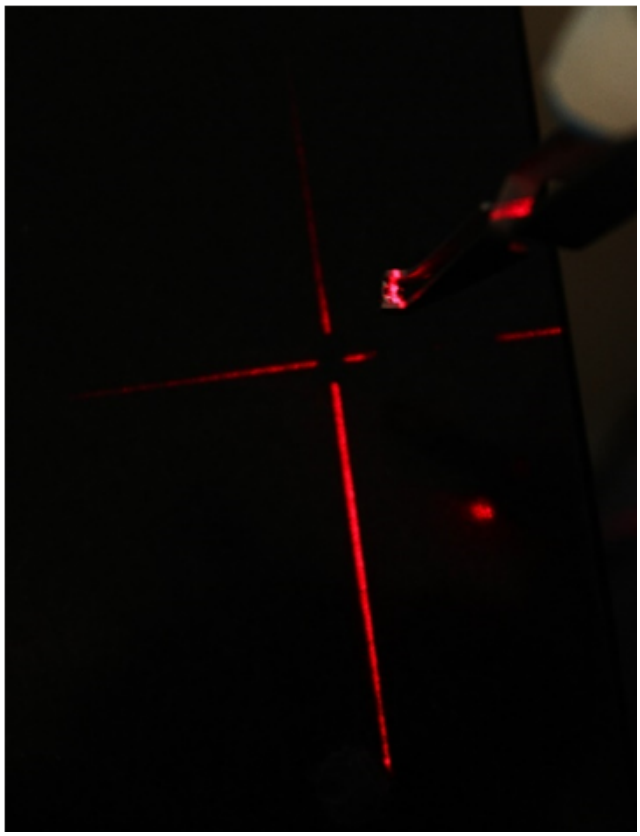

Figure 2: Diode laser projecting a '+' mark to aid in bracket placement

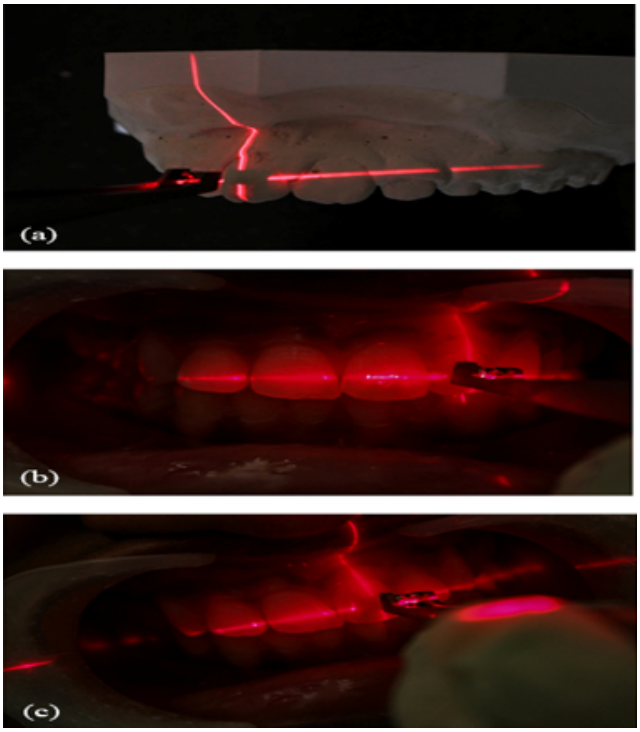

Figure 3: **(a)** Demonstration of the bracket placement using modified bracket tweezer on a model, **(b** and **c)** Clinical application of Precision-brace positioner to make the bonding procedure effortless.

1.1. Appliance design

The bracket-holding tweezer now includes a 5mW diode laser, which has been modified to project a cross-shaped ('+') sign (Figures 1 and 2). This innovation facilitates the clinician's assessment of the clinical crown's centre effortlessly (Figure 3). The laser-projected cross ('+') eliminates the need for drawing vertical and horizontal reference lines, saving considerable chairside time for the orthodontist.

Two 3 volts coin cell has been used to power the 5mW diode-laser. Studies related to Coin cells demonstrated that lithium coin cells typically last 3-5 years when properly utilised and maintained, eliminating the need to replace cells on a regular basis.

However, caution should be exercised when using the diode laser. According to studies, using a diode laser for cosmetic therapy can lead to photophobia and blurred vision.[5] Thus, it is necessary to have complete and reliable knowledge about the potential adverse effects of the Laser application technique, as well as to apply relevant safety gear properly.

2. Discussion

Many different types of brackets holding tweezers are available on the market.[6] Additionally, proper bracket alignment during bonding reduces bracket repositioning and arch-wire bending during following phases of orthodontic treatment, enhancing results predictability and reducing treatment duration.[7–9] Unwanted tooth movements such extrusion, unexpected tip, torque, and rotation are prevented. This bracket holding tweezer has been modified by incorporating a diode laser on the rear end, allowing for accurate bracket positioning. The benefits of this instrument modification are as follows.

2.1. Advantages

2.1.1. Laser-Aided bbracket tweezer

Integrates a laser unit into the bracket-holding tweezer for assessing the centre of the clinical crown with precision.

2.1.2. Time-saving bonding for clinicians

1. Addresses the challenge faced by orthodontic postgraduates in determining the tooth centre during bonding.
2. Eliminates the need for drawing unesthetic reference lines with a pencil.

2.1.3. Effortless bonding procedure

1. Instrument modification streamlines the bonding process.
2. Specifically designed to save clinicians' time and enhance efficiency during bonding.

3. Conclusion

This modification involves incorporating a diode laser, aiming to simplify the assessment of the clinical crown's centre for clinicians and post-graduates, ultimately contributing to precise bracket positioning, enhancing the orthodontic bonding procedure and significantly reducing the clinician's chair side time.

4. Source of Funding

None.

5. Conflict of Interest

None.

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