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Short Communication

A simple and innovative device to position and stabilize the expansion screw during removable appliance fabrication

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ABSTRACT

Precise positioning and stabilization of the expansion screw are crucial steps in fabricating a removable expansion appliance. The current method of inserting the plastic handle of the screw into a wax-filled well in the working model is unwieldy and often unsatisfactory. We present a simple device that is easy to construct and effective for the purpose. It permits adjustments in the depth and angulation of the screw and secures it firmly during appliance fabrication.

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1. Introduction

A removable appliance with an expansion screw is a popular orthodontic appliance in vogue for slow maxillary expansion.^{1,2} Correct positioning of the expansion screw and proper stabilization during processing are crucial steps in fabricating this appliance. The location of the screw in the sagittal plane, its orientation to the occlusal plane and maxillary midline, and the adaptation to the palatal contour are essential factors to be considered while positioning the screw.¹⁻⁶ Equally important is the stabilization of the screw in this position during the acrylization of the appliance.

In routine practice, this is done by creating a small wax-filled well at the desired location in the working model and inserting the plastic handle of the screw assembly into it.⁴ However, this procedure is cumbersome and may not offer the necessary stabilization of the screw. We present a simple device that is easy to use, effective for this purpose, and does not damage the working model.

1.1. Construction of the device

Two lateral plates of 20 X 25 millimeters (mm) and one central plate of 20 X 20 mm are cut from the commercially available 5mm thick transparent acrylic plates (Figure 1). The centerline is scribed on both the top and bottom surfaces of the central plate. A 10 X 2 mm slot is made along this line closer to the posterior end. A clamp assembly, consisting of a nut and screw of 3 mm diameter, is inserted at the posterior border of the slot. The head of the screw is modified into a knob handle by soldering a 15 mm long 0.9 mm stainless steel wire. The lateral plates are fixed over the central plate using commonly available cyanoacrylate glue, with an overlap of 3mm on both sides. Grooves of 2 mm depth are cut on the anterior and posterior borders of both the lateral plates.

1.2. Usage

For positioning the expansion screw, its plastic handle is inserted into the central slot. It is secured at the desired depth and angulation to the palatal contour by tightening the screw knob (Figure 2). During appliance fabrication, the device is stabilized by fastening a rubber

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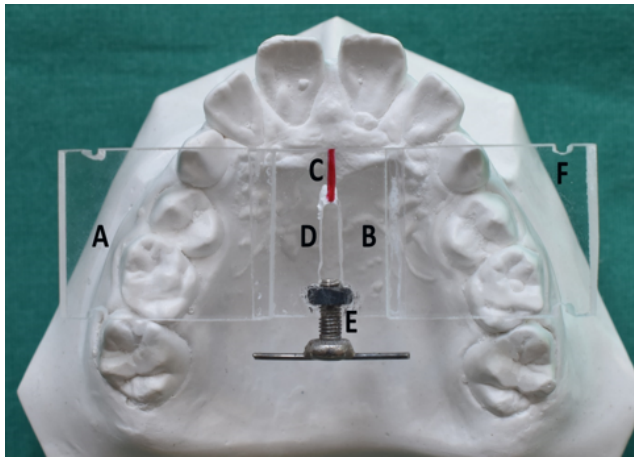


Figure 1: Parts of positioner device. **A** - Lateral plate, **B** - Central plate, **C** - Centerline mark, **D** - Slot that houses the handle of expansion screw, **E** - Clamp assembly, and **F**- Retention groove for the rubber band.



Figure 2: Positioning and fixing the expansion screw at the desired depth and angulation.

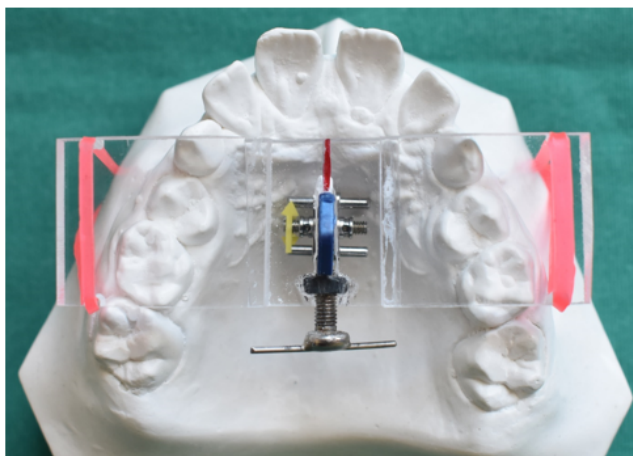


Figure 3: Securing the device to the working model with a rubber band during appliance fabrication.

band running around the model from one lateral plate to another (Figure 3). Once the area around the screw is acrylized (preferably using the sprinkle-on method), the

device can be removed from the model to allow further processing.

2. Advantages

This device is simple, economical, easy to fabricate and use. It helps in precisely orienting the expansion screw to the occlusal plane and mid-palatal raphe. The depth and angulation of the expansion screw in the sagittal plane can be easily adjusted and fixed using the clamping screw. It holds the screw firmly in position during appliance fabrication without additional measures. Lastly, the integrity of the working model is maintained by averting the need to cut retention well as done in the conventional technique.

3. Source of Funding

None.

4. Conflict of Interest

None.

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