



Mini Review

Stepwise Advancement Simplified - A Modified Frankel II

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ABSTRACT

Frankel II appliance has been one of the most commonly used appliances in treating class II malocclusions with retrognathic mandible. For step wise advancement, clinicians usually follow the conventional method suggested by Rolf Frankel by splitting the buccal shields and advancing the lower labial pads and lingual pads as a unit, followed by re-acrylisation or by fabrication of a new appliance. The modified Frankel II appliance is constructed by incorporating two orthodontic expansion screws on either side of the buccal shields of Frankel II during the fabrication of the appliance. Activation of the expansion screws will help in advancing the lower lingual pad and the labial pads as a unit therefore offering several significant advantages over the previously used technique.

Keywords: Modified FR II; Stepwise advancement in FR II; Hybrid appliance

1 INTRODUCTION

Class II malocclusion with skeletal mandibular retrusion is one of the most common types of malocclusions presenting in day-to-day clinical practice. Functional appliances were introduced in the early 1900s and since then, have gained popularity worldwide. Among these appliances one of the most approved is functional regulator (FR). The framework of the FR appliance provides an artificial balancing of the environment, thereby promoting more normal pattern of muscle activity. The FR appliance alters muscle forces in the labial and buccal areas that restricts skeletal growth, thereby providing an environment which maximizes skeletal growth. The Frankel II appliance consists of acrylic and wire components. The vestibular (buccal) shields and the lower labial pads form the acrylic component. The upper labial wire, the canine extensions, upper lingual wire, the cross-over wire to the lingual shield and the support wires for the lower lip/labial pads embedded in the vestibular shield form the wire components (Figure 1).

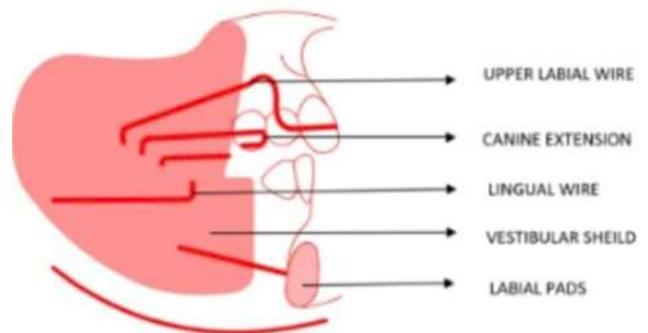


Fig. 1: Frankel II Appliances

The lower labial and lingual pads serve as a guide for the establishment of the altered mandibular postural position used in the correction of Class II malocclusion. These pads act as tactile reminders to the patient to position his or her jaw anteriorly. Rolf Frankel has advocated step wise

advancement with Frankel II appliance for treating severe Class II malocclusions^(1,2). According to him, step wise advancement has to be done after 4-6 months of initial advancement. It is done by splitting the buccal shields (Figure 2) and advancing the lower labial pad and lingual pads manually as a unit (Figure 3), and re-acrylize (Figure 4), which can be time consuming and cumbersome laboratory procedure. The other alternative is to fabricate a new appliance.

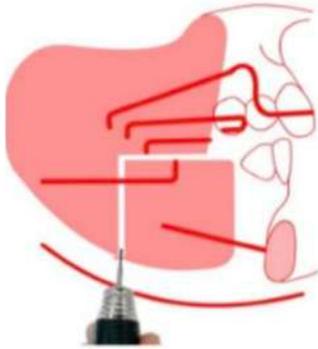


Fig. 2: Buccal shield splitting

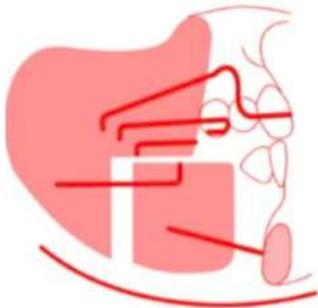


Fig. 3: Lower labial pad and lingual pads

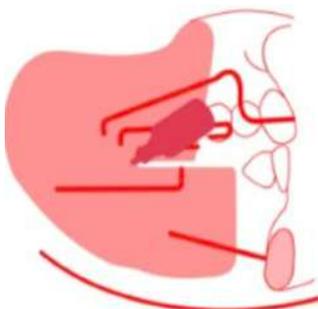


Fig. 4: Re-acrylizing

2 TECHNIQUE

In this Modified Frankel II appliance, all the components are the same as that of Frankel II appliance, except the inclusion of two expansion screws (Figure 5).

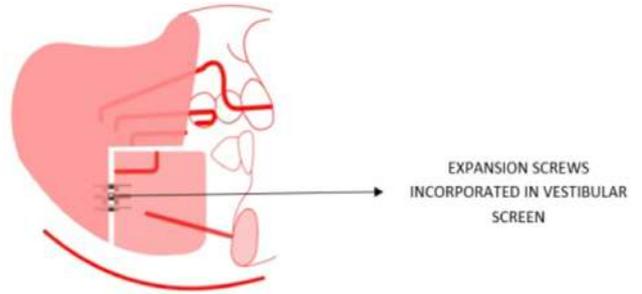


Fig. 5: Schematic representation of modified Frankel II appliances

Two orthodontic expansion screws are incorporated on either side of the buccal shields during the fabrication of the appliance, before acrylization. The expansion screws are oriented parallel to the occlusal plane. Wire components of lower lingual pads and lower labial pads are placed anterior or mesial to the expansion screws (Figure 6), (Figure 8), (Figure 9), to enable a single unit advancement of pads, with the activation of the screws. The expansion screws can be activated by the keys provided by the manufacturer for the desired amount of advancement (Figure 7) and (Figure 10).

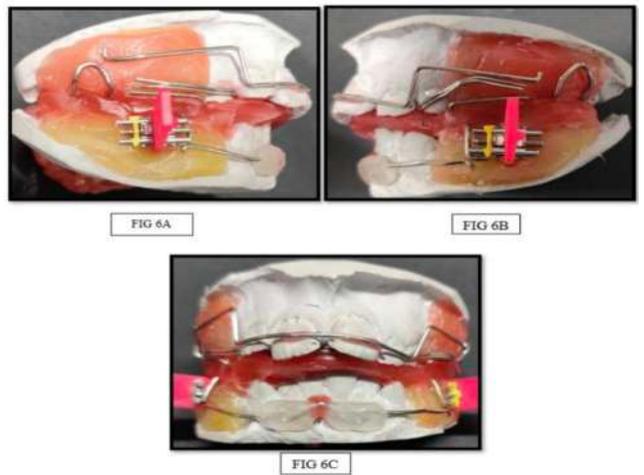


Fig. 6: Positioning of expansion screws and wire components before acrylization

3 DISCUSSION

This approach offers several significant advantages over the previously used technique. It eliminates the need for new appliance fabrication. It eliminates the time consuming and

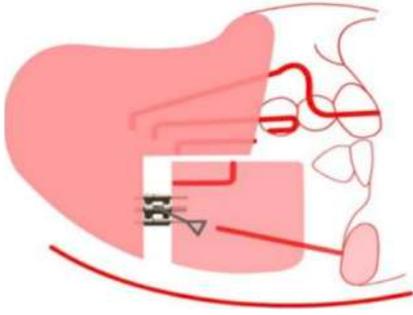


Fig. 7: Expansion screws activation

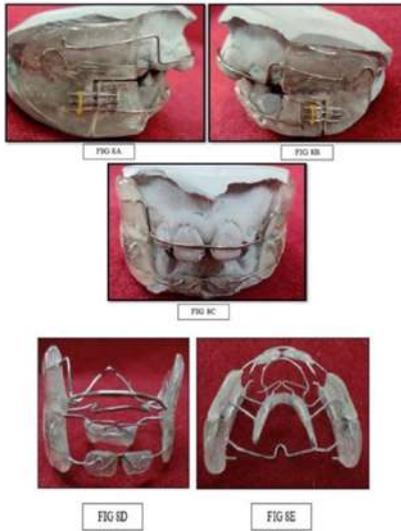


Fig. 8: A-E, Modified Fränkel II appliances after acrylicization



Fig. 9: Modified Fränkel II appliances with initial advancement

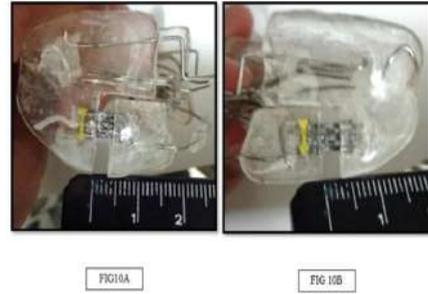


Fig. 10: Modified Fränkel II appliances after step wise advancement cumbersome laboratory procedure involving splitting of buccal shields and advancing the lower lingual shield and lip pads and acrylicization. The step wise advancement with this modification of FR II is efficient, accurate, predictable, simple and time saving.

4 CONCLUSION

This innovative approach for step wise advancement of FR-II appliance can render similar treatment effects as conventional FR appliance. Modified FR-II is adding a silver lining to the list of hybrid functional appliance.

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