ABSTRACT

One of the most common clinical challenges encountered with facemask therapy for early correction of skeletal Class III malocclusions is the delivery of appropriate direction of force for effecting the pure translation of maxilla. This technical note describes a novel method involving the use of Begg's auxiliary for achieving efficient and predictable delivery of protraction forces. With this modified assembly, effective vector control for facemask can be achieved without the need to remove the bonded Hyrax assembly. This chairside modification is an effective and invaluable method for predictable force delivery in facemask therapy.

KEYWORDS: Begg’s auxiliary, Class III malocclusion, facemask, hyrax assembly, vector control

Introduction

Class III malocclusions often pose management and prognostic challenge to the clinician. Protraction facemask is being widely used in the early treatment of skeletal Class III malocclusions with maxillary deficiencies.[1] A critical aspect of successful facemask therapy is the application of optimal force at the desired level and angulation.

Application of orthopedic force below the center of resistance of the maxilla tends to tip the palatal plane, thus producing counter-clockwise maxillary rotation, which may be undesirable in patients with hyperdivergent growth patterns. Translation is produced if the force is applied along the zero-moment line of force.[2]

To minimize tipping of the palatal plane, it is recommended to attach the protraction elastics to hooks located near the maxillary canines with a downward and forward pull of 30° from the occlusal plane.[1] However, slippage of the elastics, thus altering the angulation of pull, is a frequently encountered problem. Moreover, in patients with a reduced depth of the vestibular sulcus, accurate positioning of the hooks poses a clinical challenge. In certain clinical situations, it may also be required to change the desired vector of protraction midtreatment, which necessitates the removal of Hyrax assembly and repositioning of the hooks, thus requiring a cumbersome second clinical laboratory procedure and causing inconvenience to the patient. Presented here is a practical and clinically effective method of avoiding these problems by simply attaching a Begg’s auxiliary (molar tube) to the hooks.
of Hyrax assembly, intraorally, without removal of the assembly from the patient’s mouth [Figure 1].

**Clinical Presentation**

**Technique for achieving improved vector control**

The patient complained of slippage of the elastics from the hook attached to the Hyrax assembly. A 0.036" slot weldable Begg's auxiliary molar tube was used, and its flanges were opened with the aid of Weingart plier as shown in Figure 2. The auxiliary tube with opened flanges was secured at the desired position on the vertical segment of the 0.036" wire with carding wax and was carefully crimped with a Weingart plier [Figure 3]. The properly secured auxiliary prevented any slippage of the elastics and allowed traction at the desired angulation [Figure 4].

**Discussion**

Since two decades, facemask in conjunction with expansion therapy has emerged as a most effective treatment modality for the management of skeletal Class III malocclusion with retrusive maxilla especially in pediatric patients with hypodivergent growth pattern. Absolute patient compliance and high motivational levels regarding adherence to the recommendations for the duration of appliance wear are crucial for ensuring treatment success. Facemask therapy, when used as per prescription, has also been employed to achieve significant anterior maxillary movements in aptly selected patients with unilateral cleft lip and palate.

Regarding the position of the hooks of the Hyrax assembly, it has been suggested that the hooks should be positioned in canine-premolar (or deciduous first molar) area in horizontal growers. However, in vertical growers, hooks can be placed more anteriorly and slightly at a higher position.

As for the effects of varying the direction of force on maxillary protraction, the force applied intraorally from the canine region, at a 30° angle to the occlusal plane (below the center of resistance of the maxilla) is effective in protracting the maxilla with a counter clockwise rotation. On the contrary, the force applied with a modified extraoral facial arch, 20 mm above

![Figure 1: Intraoral frontal view illustrating Begg's auxiliary tube attached to the hooks](image1)

![Figure 2: Begg's molar tube used as the auxiliary attachment](image2)

![Figure 3: Crimping of the auxiliary onto the hooks using Weingart plier](image3)

![Figure 4: Auxiliary attachment preventing any slippage and aiding in the desired direction of pull.](image4)
the maxillary occlusal plane (closely approaching the center of resistance of the maxilla) is particularly effective to translate the maxilla anteriorly without rotation especially in Class III malocclusion combined with an anterior open bite. Thus, adequate vector control is imperative to achieve predictable outcomes in different clinical presentations.

For obtaining adequate vector of protraction forces mid-treatment, the Begg’s auxiliary tube was chosen as it is easy to handle, has an ergonomic design (round cross-section), and relatively inexpensive. The simple modified assembly described for achieving effective vector control offers the following advantages:

1. Placement of auxiliary at appropriate position prevents slippage of elastics, thus ensuring better patient compliance
2. Patient can engage the elastics with greater ease and minimum effort
3. This technique precludes the need for removal and replacement of bonded Hyrax assembly mid-treatment, hence considerably reducing the chairside time
4. Eliminates the need for relocating the bend in the hooks for securing elastics.

**Conclusion**

This simple chairside technique enables predictable and efficient delivery of protraction forces with facemask, without removing the Hyrax assembly.

**Clinical Relevance**

A simple and effective chairside modification for achieving effective vector control for facemask therapy using economical and easily available Begg’s auxiliary is described, which avoids the need to remove the Hyrax assembly midtreatment, thus reducing discomfort to the patient.

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**Conflicts of interest**

There are no conflicts of interest.

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