

ORTHOPAEDIC CORRECTION OF SKELETAL CLASS III IN AN 8 YEAR OLD WITH PETIT FACE MASK AND PALATAL EXPANSION - A CASE REPORT

ABSTRACT

The orthodontic treatment of class III malocclusion with a maxillary deficiency is often treated with expansion. The following case report outlines the management of an 8 year old female patient with maxillary deficiency and a reverse overjet. Treatment was carried out with Petit face mask along with hyrax screw incorporated in maxillary acrylic plate followed by retention of Frankel III appliance.

Keywords: Face mask, maxillary deficiency, Palatal expansion.

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INTRODUCTION

The Prevalence of Class III malocclusion varies in different population and races and in variable among different ethnic groups. Gauba et al in 1998 reported the incidence of Class III malocclusion in India as 18 %¹.

Young patients with skeletal class III dentofacial deformities present with maxillary skeleton retrusion, mandibular skeletal protrusion or a combination of two.

Therapeutic regimens designed to improve the facial morphology in class III Skeletal malocclusion during the growth period include extraoral traction with face mask, functional regulator (FR-3), the chin cup, modified tandem appliance and so on². Surgical treatment is more effective to eliminate skeletal problem but this treatment modality also involves higher risk and greater costs.

It is well established that sutural growth can be stimulated in young patients.^{3,4} For these reason and because mandible prognathism is more often due to maxillary deficiency than mandibular excess, maxillary protraction can be a favourable treatment for cases with class III malocclusion.⁵ The principle of maxillary protraction is to apply tensile force on the circumaxillary suture and thereby stimulate bone apposition on the suture areas.⁶ These changes can be brought about with the use of face mask along with hyrax screw incorporated into maxillary splint.

This paper highlights the treatment of an 8 year old female patient with a skeletal midface deficiency/ maxillary deficiency managed exclusively in the Department of Paediatric Dentistry with a petit face mask and maxillary expansion splint.

CASE REPORT

An 8 year old girl child reported to the outpatient of Paediatric Dental OP clinic with a chief complaint of lower teeth overlapping upper teeth. Extraoral examination revealed a mesoprosopic face with a concave profile and a apparently deficient maxilla and flat

malar eminences. Intraoral examination revealed the patient to be in mixed dentition period. She had anterior and bilateral posterior crossbite (Figure 1). The cephalometric analysis revealed a deficient maxilla. After diagnosis of maxillary deficiency and constricted maxillary arch was established. A maxillary rapid palatal expansion appliance (hyrax screw) with face mask hooks (Figure 2) was bonded to the upper teeth. The hyrax screw was activated once daily (one turn or 1/4 mm per day). After two weeks of expansion a petit face mask with two acrylic pads lined with soft foam that contact the soft tissues in the forehead and chin region connected by a midline frame work to which a cross bar is attached was delivered (Figure 3).

The face mask was secured to the intraoral appliance by stretching 14oz 1/2 inch elastics from the hooks on the maxillary splint to the cross bar of the face mask generating 300gms of force. The post insertion angulations of the elastics were at around 30° so as to achieve a forward and downward pull of the maxilla. The patient was advised to use the face mask for 14 hours a day. Eleven months into the treatment a positive overjet was established and the posterior crossbite were relieved (Figure 4). Extra orally a significant improvement was noted in her profile. Lateral cephalogram (pre and post Figure 5) and their analysis indicate favourable treatment outcome (Table 1).

After active treatment the maxillary splint and the face mask was removed and Frankel III was inserted for active retention (Figure 6).

DISCUSSION

The face mask was first described more than 100 years ago⁷ Soon after modification started appearing over a period of time.⁸ After Delaire contributed the Delaire face mask. Petit modified the face mask to petit face mask with increased force and lesser treatment time.⁹



Figure 1



Figure 2



Figure 3



Figure 4



Figure 6



Figure 5

Table 1: Cephalometric Analysis

Parameters	Pre-Treatment	Post-treatment
Co - point A	83mm	89mm
Facial Angle	90°	91°
Angle of Convexity	0°	7°
SNA	79°	82°
SNB	81°	80°
ANB	-3°	1°

In the present case a version described by McNamara was used. A maxillary splint to which an expansion screw (hyrax screw for RME) was incorporated was bonded to the posterior teeth. The splint was fitted with two hooks which lie adjacent to the canine or first deciduous molars. A Petit face mask was secured to the splint with elastics¹⁰ which provides 300 to 600 g of force per side for 14 hours a day. Activating the expansion appliance leads to opening of faciomaxillary sutures thus enhancing the effect of orthopaedic effect of face mask.¹¹

The rapid maxillary expander also produces a forward movement of point A and a downward and forward movement of maxilla.¹² which had a favourable result on the correction. The treatment timing has a huge impact on the results. The mid palatal and circumaxillary sutures are smooth and broad during the mixed dentition ages and react favourably to treatment. During the pubertal age inter-digitation and areas of bony bridging across the suture develop to the point that maxillary expansion becomes difficult.¹³ Studies point to evidence that greater orthopedic effect is observed when the therapy was applied before or during the pubertal growth spurt (7-12 yrs)¹⁴. The present case was treated at 8 years.

A functional appliance (Frankel III) was used as a retention appliance. There has been supporting evidence that over correction and use of functional appliance as a retainer led to stable positive results¹⁵. The patient continues to be on follow up every three months. The result remains stable till date.

This article described the combination of a bonded maxillary splint with a rapid maxillary expander and an orthopaedic petit face mask using elastics to correct a developing skeletal class III malocclusion. The successful resolution of this case indicates that this therapeutic combination can be effective in class III patients who present in the skeletal and dental imbalance.

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