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Case Report

Correction of a Skeletal Class III with Anterior Cross Bite using Maxillary Protraction Therapy

Vineet Golchha* and Pooja Sharma

Department Of Orthodontics, IP Dental College, India

***Corresponding author**

Vineet Golchha, Department Of Orthodontics, IP Dental college, Sahibabad, India, Email: orthovineet@gmail.com

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Abstract

The skeletal Class III malocclusion though comparatively small in incidence is one of the most difficult malocclusion to treat. It can be due to maxillary retrognathism, mandibular prognathism or both. Reverse pull Headgear or Face Mask have been used for early maxillary protraction. Face mask therapy has been shown to improve the skeletal relationship. The article presents a case report of the skeletal class III treated using a Face mask and Reverse Twin block appliance.

INTRODUCTION

The incidence of skeletal class III is rather small in the population but it is one of the most difficult malocclusion to treat. Class III malocclusions are often seen with maxillary retrognathia, mandibular prognathia or a combination of both. Ellis and McNamara found that 65-67 % of all Class III malocclusion were characterized by maxillary retrognathia [1]. Thus maxillary protraction is an important paradigm in early management of Class III malocclusion. It was Jean Delaire who popularized in 1970s the concept of maxillary protraction with his device called the facial mask [2]. In 1983 Henry Petit modified the Delaire mask by increasing the amount of force generated by the appliance [3]. Present article shows a skeletal class III with anterior cross bite treated with face mask and a reverse twin block appliance.

CASE REPORT

A 13 year old female patient Preeti presented with a chief complaint of forwardly placed lower jaw. She had a class III malocclusion with concave profile, retrognathic maxilla, malar deficiency, average growth pattern, normal nasolabial angle (Figure 1a).

On intraoral examination revealed mild mandibular anterior crowding Molar relationship Class III on right side and Class I on left side with a reverse over jet of 3mm and over bite of 4mm. There was a forward functional shit to anterior on occlusion (Figure 1b).

On radiographic examination all the teeth were present except the erupting third molars. CVM Maturation Status – CVS 5 indicating a decelerating phase of growth. Skeletal Class III malocclusion with retrognathic maxilla, orthognathic mandible, average growth pattern and slightly proclined upper incisors (Figure 2). Considering the above findings, it was decided to undertake two phase treatment.

Phase I

The first phase of treatment was started with reverse twin block and reverse pull headgear (Figure 3). Reverse twin block was constructed with a vertical opening of 5mm and anterior positioning of 5mm. Two hooks were incorporated in the canine region for attachment of extra-oral elastics. The treatment phase lasted for eight months (Figure 4).

Figure 1a Pretreatment: Extra oral photographs.

Figure 1b Pretreatment: Intra oral photographs.

Phase II

After that non extraction fixed appliance therapy was started with PEA appliance, 0.022" slot MBT prescription (Figure 5). The duration of treatment was eighteen months a key stage of treatment is shown in Table 1.

Post treatment a Class I Incisor relationship, Overjet: 2mm and Overbite: 2mm with Buccal segment relationship Class I on left and right side (Figure 6a). Good facial improvement was seen, concavity of the profile reduced (Figure 6b)

Cephalometric interpretation revealed that SNA increased by 1°, SNB decreased by 1° Mandibular plane angle increased by 2° and Naso labial angle increased by 3° Maxillary and mandibular incisors were proclined (Figure 7,8) (Table 2).

Maxillary and mandibular wrap around retainers were delivered (Figure 9).

Figure 2 Pretreatment Cephalogram and OPG.

Figure 3 Photographs showing Reverse Twin block and Face mask.

Figure 4 Post -orthopedic therapy Intra oral photographs.

Figure 5 Post -alignment Intra oral photographs.

Table 1: Key stages in treatment progress.

Sl	Date	Stage
1	24 /08/05	Reverse twin block inserted. Petit's face mask given
2	10 /04/06	Reverse twin block removed. records made
3	12 /04/06	Maxillary arch bonding and banding done 0.014 Niti arch wire placed
4	23/06/06	U 0.016 Niti arch wire placed
5	12/09/06	U 16-22 Niti arch wire placed. Lower banding and bonding done 0.016 Niti arch wire placed.
6	17/11/06	U 17 – 25 SS arch wire. L 16-22 Niti arch wire placed
7	20/01/07	U 19-25 SS , L 17-25 SS arch wire placed
8	16/04/07	L 19- 25 SS arch wire placed
9	11/07/07	U/ L 0.016 SS finishing wire with settling elastics
10	13 /09/07	Debonding done. Records made

Figure 6a Post treatment Intra oral photographs.

Figure 6b Post treatment extra oral photographs.

DISCUSSION

In orthopedic treatment an attempt is made to influence the morphology of craniofacial skeleton. The use of face mask provides a direct constant anterior force to the maxilla leading to anterior displacement of maxillary sutures. Fixed Reverse Twin block serves as an intra oral appliance for attachment of force modules as well as create an anterior force on the maxillary arch. Orthopedic treatment of class III malocclusion is believed to be more effective in early mixed dentition but those treated in late mixed dentition are still benefited though may be to a lesser extent [4]. Treatment effects of protraction therapy is

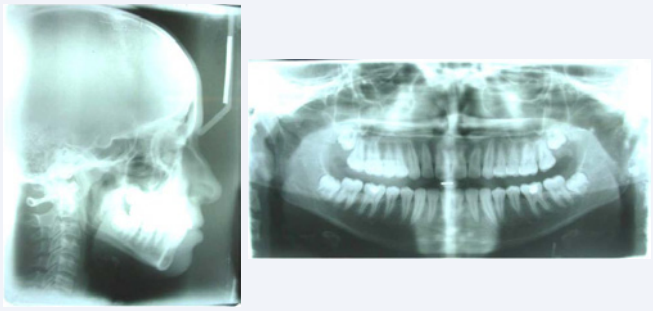

Figure 7 Post treatment Cephalogram and OPG.

Figure 8 Pre and Post treatment Cephalometric Super imposition.

Table 2: Pre and Post treatment Cephalometric reading comparison.

Variable	Normal	Pre-treatment	Post-treatment
SNA	82° ± 2	75°	76°
SNB	80° ± 2	77°	76°
ANB	2 ± 2	-2	0
Wits Appraisal	0mm	-5mm	-3mm
Upper incisor to NA (mm / deg)	22° / 4mm	25° / 7mm	27° / 8mm
Lower incisor to NB (mm / deg)	25 °/4mm	25° / 5mm	26° / 6mm
Lower incisor to mandibilar plane angle	90°	91°	92°
Interincisal angle	131°	126°	131°
SN plane - Mandibular plane angle	32°	31°	33°
Nasolabial angle	102 ± 8°	98°	101°

Figure 9 Retention photographs.

a combination of skeletal and dental changes, maxilla moves downward and forward as a result mandible rotates downward and backward. Upper incisor inclination tend to increase while lower incisor inclination decreases, helps in anterior cross bite correction. Post treatment stability of class III malocclusion has shown a conflicting result; however Turley showed patients with maxillary deficiency but normal mandibular dimensions generally showed good stable results [5].

CONCLUSION

Good facial improvement was seen at the end of treatment. The concavity of the profile reduced. The improvement in facial profile could have been achieved by slight downward and backward rotation of mandible and inclination of anterior teeth. Crowding in upper and lower arch was corrected. Class I molar and incisor relation was achieved. Midlines were coinciding. Good functional occlusion was achieved. The patient had a consonant smile at the end of treatment. Prognosis for stability is good.

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