

TREATMENT OF A SKELETAL CLASS III SITUATION IN LATE MIXED DENTITION STAGE.

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ABSTRACT

Skeletal class III malocclusion is one of the most difficult problem to treat. It has multifactorial etiology. Genetics, racial, environmental, habitual posture are the factors that can be involved in the etiology. Treatment of skeletal class III problem due to maxillary deficiency is usually done by maxillary protraction with facemask in young children. Although the ideal treatment timing for this kind of approach is before the age of 8-9 years in deciduous and early mixed dentition, but it is also seen to be effective in late mixed dentition also and less effective thereafter in early permanent dentition. The following case report shows treatment in a young girl in late mixed dentition period with moderate skeletal class III discrepancy using RME and facemask.

KEY WORDS

Skeletal class III, facemask, late mixed dentition.

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INTRODUCTION

Skeletal class III malocclusion is the most difficult to treat than other malocclusions. The developing class III malocclusion is very challenging to treat because retention time is prolonged and relapse tendencies are much high. Various modalities are available to intercept and treat class III situation¹. These are 1. Interception of problems through dentofacial orthopedics (Protraction facemask, FR-III, Reverse twin block, Class III bionator, chin cup) 2. Camouflage treatment. 3. Orthognathic surgery (undertaken when growth is completed).

Maxillary deficiency in growing patients is corrected by pulling the maxilla forward with help of protraction face mask. Maxillary transverse expansion is needed before starting the maxillary protraction. Maxillary transverse expansion loosens the circum-maxillary sutures making the maxilla a little more free for easy protraction².

Growth of the mandible continue till late teens and sometimes in early twenties also. This is the reason why class III malocclusion are considered most difficult to treat. Retention of treated situation is a big challenge as even very less remaining growth also can be harmful to cause relapse. So follow up of the patients is continued for a long time.

CASE REPORT

A 10 year old girl came with the chief complaint of forwardly placed lower front teeth in the department of Orthodontics and dentofacial orthopedics, Dr. R. Ahmed Dental college and hospital, Kolkata. Patient had no relevant medical and dental history. On extraoral examination patient has anterior divergent face (Fig 1A). On intraoral examination, all hard tissues and soft tissues were normal (Fig 1B). Patient had late mixed dentition as upper second premolars and lower canines were in erupting process. There was reverse overjet of 2.5mm with overbite of 4mm. Posterior teeth were in cross bite. Centric relation of the jaws was coincident with centric occlusion, suggesting a true Class III malocclusion rather than a pseudo-Class III

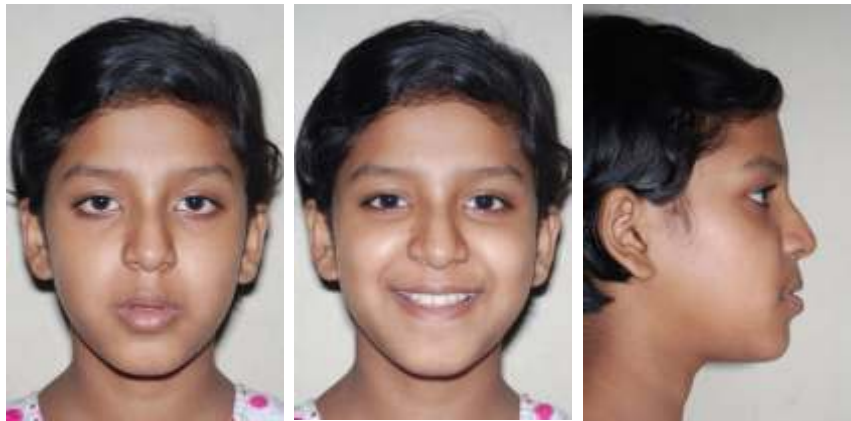


Fig 1A. Pretreatment photographs



Fig 1B. Pretreatment photographs



Fig 2. Pretreatment lateral cephalogram and orthopantomogram

Measurements	Norms	Pre treatment	After phase I	After phase II
SNA	82°	76°	79°	78°
SNB	80°	80°	79°	79°
ANB	2°	-4°	-0.5°	-1°
WITS	-2 to +2 mm	-7mm	-2mm	-2mm
SN-GoGn	32°	31°	32.5°	33°
UI to SN plane	102°	108°	109°	110
IMPA	90°	86.5°	86°	86°
Nasolabial angle	102°	93°	92°	91°
Na ? to point A	0 to 1mm	-6mm	-2.5mm	-3mm
Interincisal angle	132°	131°	127°	126.5°
Midface length (Co-A)		70.5mm	74.5mm	74.5mm
Upper lip to E line	-4mm	-3mm	-2.5mm	-2.5mm
Lower lip to E line	-2mm	+2.5mm	+1mm	+0.5mm

Table 1. Cephalometric evaluation

situation. The patient had class III skeletal base with retrognathic maxilla (Fig 2, Table 1).

TREATMENT OBJECTIVES

Treatment objectives were to correct transverse and sagittal discrepancies.

1. To correct anterior and posterior cross bites
2. Correction of skeletal class III jaw base relation
3. Correction of molar and canine relationships
4. Obtaining ideal over jet and overbite.
5. Obtain pleasant esthetics.

TREATMENT PLAN

As the patient came in mixed dentition stage, growth modification with orthopedic appliance will be best choice in this patient. So a bonded RME appliance followed by facemask was chosen as treatment modalities for this patient. Good cooperation was expected as parent was aware of the problem.

First phase-RME Expansion with face mask therapy.

Second phase-Fixed preadjusted edgewise appliance for detailing of occlusion.

TREATMENT PROGRESS

First 11mm Hyrax RME screw with acrylic bite blocks on posterior teeth was cemented on maxillary

dentition. Two hooks were present one on each side of the RME appliance for engagement of elastics (Fig 3). The RME screw was opened two times a day for one week and once a day thereafter until over correction of posterior cross bite was achieved.³ Petit type of facemask was used. The protraction elastics were attached to hooks with a downward and forward pull of 20 degree to the occlusal plane⁴ (Fig 4). Elastics that delivered 300 to 500gms of force per side as measured by Dontrix gauge, were applied.⁵

The facemask was placed after one week of rapid maxillary expansion and patient was instructed to wear facemask for a duration of 14hours per day. Sequence of elastics was, first 3/8 8 oz for 2 months, then 3/8 14 oz for 2 months and last 5/16 14 oz for 3 months and lastly 1/4 14 oz for 2 months.

Positive overjet of 2 mm was achieved with facemask in 9 months. The soft tissue profile was improved. After treatment upper lip was no longer behind lower lip (Fig 5 & 6).

This was followed by a retention phase of 6 months.

Till then all permanent teeth were erupted so preadjusted edgewise appliance was bonded for detailing of occlusion.

DISCUSSION

Several studies have demonstrated the importance of early treatment in Skeletal Class III patients. RME with facemask is a very good option



Fig 3. Rapid Maxillary Expansion screw (Hyrax screw)

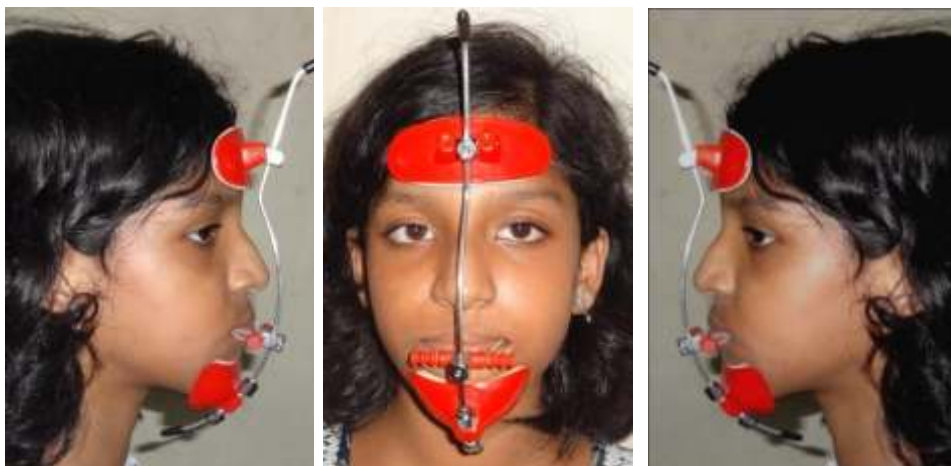


Fig 4. Face mask appliance

TREATMENT RESULTS



Fig 5. Before facemask



Fig 6. After facemask



Fig 7. After facemask

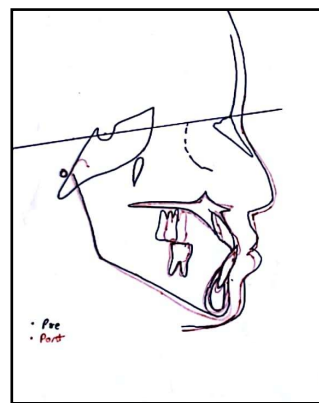


Fig 8. Superimposition

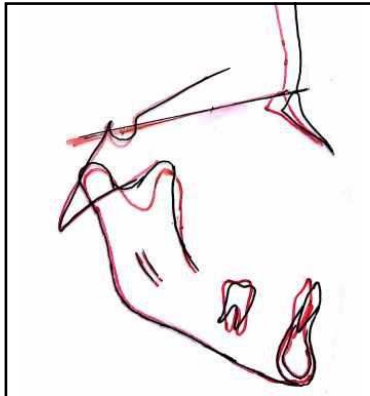


Fig 9. Superimposition of mandible

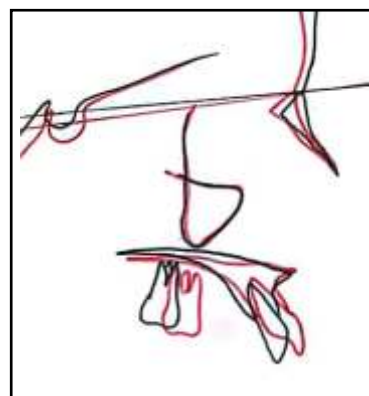


Fig 10. Superimposition of maxilla



Fig 11. Post treatment radiographs

Class 1 canine relation were obtained on both sides. 2 mm positive overjet was achieved. Class 1 molar relation were obtained on both sides.



Fig 12. Post treatment photographs

for treatment of Maxillary deficient class III problem in young age. By proper selection of case orthognathic surgery and/or extraction for camouflage treatment can be avoided. Although ideal time for facemask is in early mixed dentition stage.⁶ But in late mixed dentition also this one is the ideal treatment option. To avoid surgery facemask should be tried in early permanent dentition also, it may provide satisfactory result in those patients who report in early permanent dentition stage.⁷

In this case report, with good patient compliance, the effect of maxillary protraction was evident as the facemask therapy began. The SNA angle ANB angle increased indicating skeletal correction during facemask therapy. However, after the use of class III intermaxillary elastics, the proclination increased to 1100 bringing about a dentoalveolar effect to achieve a class I canine and molar relation.

Due to protraction of the maxilla, a downward and backward rotation of the mandible occurred leading to an increase in lower anterior facial height (Table 1, Figure 10). This is a common effect and has been reported in past cases as well⁸. Both skeletal and dentoalveolar effects of facemask therapy resulted in correction of the malocclusion and an overall normalization of the unesthetic facial concavity. Figure 12 shows post treatment photographs.

CONCLUSION

Treatment of skeletal class III patients gives excellent results in growing young patients by protracting maxillary complex.

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