

CASE REPORT

Complex Malocclusion Simple Solution

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ABSTRACT

Treatment of class III malocclusions is dealt by a small percentage of orthodontic practices, and providing them with optimal treatment is a tough task. Treatment of class III malocclusions is always an enigma for orthodontists, whatever the stage of severity associated with the malocclusion. Such cases, if required in early mixed dentition, can be given optimal results with minimally invasive protocols.

In nongrowing individuals, nonextraction or nonsurgical treatment modalities are a challenging task for any orthodontist. Face mask therapy for growing individuals produces predictable maxillary protraction against the prognathic mandible.

Keywords: Face mask therapy, Growing individuals, Maxillary protraction, Nonextraction approach.

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INTRODUCTION

Patients with mesial step occlusion, i.e., Angle's class III malocclusions, have lowest incidence among the variety of malocclusions reported in orthodontic practices.

Their optimal treatment itself is an uphill task; skeletal or dental attributed as maxilla as a bone being deficient

in sagittal and sometimes may or may not be associated with horizontal dimensions.¹

This itself produces mandible along with chin prominence and anterior divergent face relationship.

However, class III malocclusion is presented by maxillary deficiency, mandibular prognathism, and/or combination of both.¹² True class III and pseudo-class III need to be diagnosed well. Pseudo-class III relationship is produced by centric relation–centric occlusion shift, leading to mesial shift of lower arch in the absence of maxillomandibular discrepancy.²

PRETREATMENT ASSESSMENT AND CASE SELECTION

A 9.5-year-old male patient studying in primary school reported at daily general practices for toothache. On thorough clinical examination and answering his chief complaint, severe anterior cross-bite was noted (Fig. 1).

The same was informed to the patient along with his parents as it is an orthodontic triage and needs urgent attention. On recording complete history, mother-side siblings were reported to have the same kind of malocclusions in mild-to-moderate forms, but none of them were treated in the past.

Hence, genetic predominance for the development of skeletal class III malocclusion was proved beyond doubt.¹⁰ After thoroughly examining free way space and path of closure, no dental interferences were noted, and this ruled out functional shift (pseudo-class III), and class III malocclusion of skeletal type was confirmed.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initial will not be published, and due efforts will be made to conceal their identify, but anonymity cannot be guaranteed.

Records Measurement Step

- Upper and lower deep study model impressions were made and plaster casts were poured out of it.
- Lateral cephalogram and orthopantomogram (OPG) X-ray were recorded (Fig. 2).

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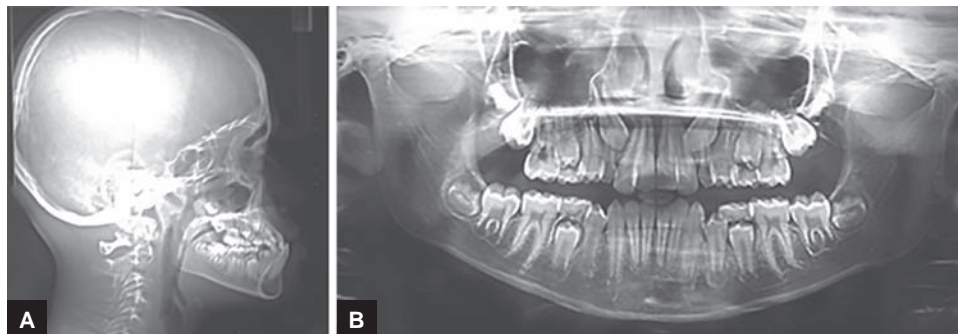
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Figs 1A to H: Preoperative intra-oral and extra-oral photographs



Figs 2A and B: Preoperative radiographs

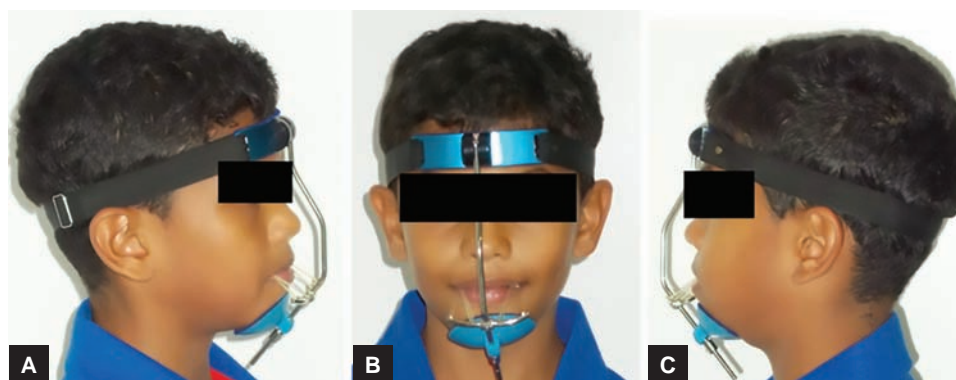
- Bite registration was done to confirm interdigitation of teeth.
- Extraoral and intraoral photographs were recorded.

On complete clinical examination, cephalometric evaluation, and model analysis, it was confirmed that maxillary bone was retro-positioned and deficient in width as well. Predictable growth spurt was obtained from cervical vertebrae maturity index.

After successful explanation of treatment plan to parents as well as patient, we amicably agreed to start interceptive orthodontics.

The patient looked to be promising and was really keen on not going for orthognathic surgery at later stage of life which made our job a lot easy. Due to lots of research on skeletal class III malocclusions, we had many choices.

But we resolved to adhere to the basic principles of maxillary expansion by rapid palatal expander (RPE) (fixed Hyrax expander) as illustrated by Dr James McNamara, followed by removable facial mask therapy as a reverse pull head gear for orthopedic protraction of maxilla.



Figs 3A to C: Reverse pull headgear face mask therapy (PETIT TYPE)



Figs 4A to H: Postoperative extra-oral and intra-oral photographs

Treatment Objectives

Aims and objectives of treatment were to take advantage of growth, wherein mid-palatal suture is less interdigitated along with other dentofacial and dentoalveolar sutures.^{13,14} Face mask therapy would restrict the mandibular prognathism by chin cup and orthopedic force could bring out maxillary protraction correcting negative over jet.³⁻⁵

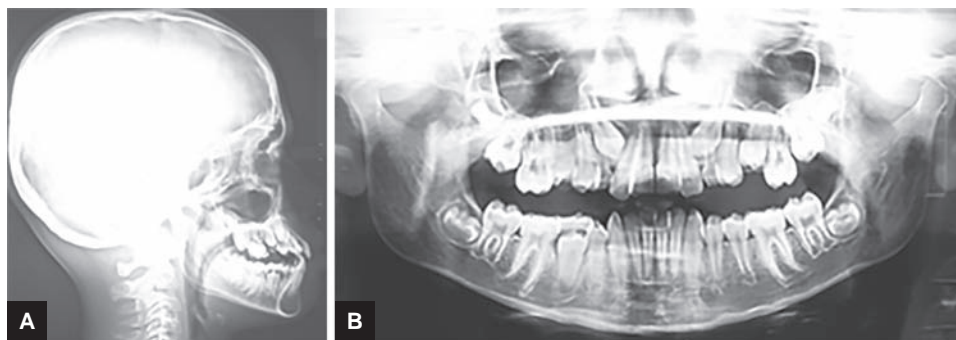
In the following stage, once skeletal bases are corrected, orthodontic correction can be carried out by fixed

mechanotherapy so as to bring hard tissue correction along with pleasing soft tissue profile. Thus, anterior divergent face type became straight type.

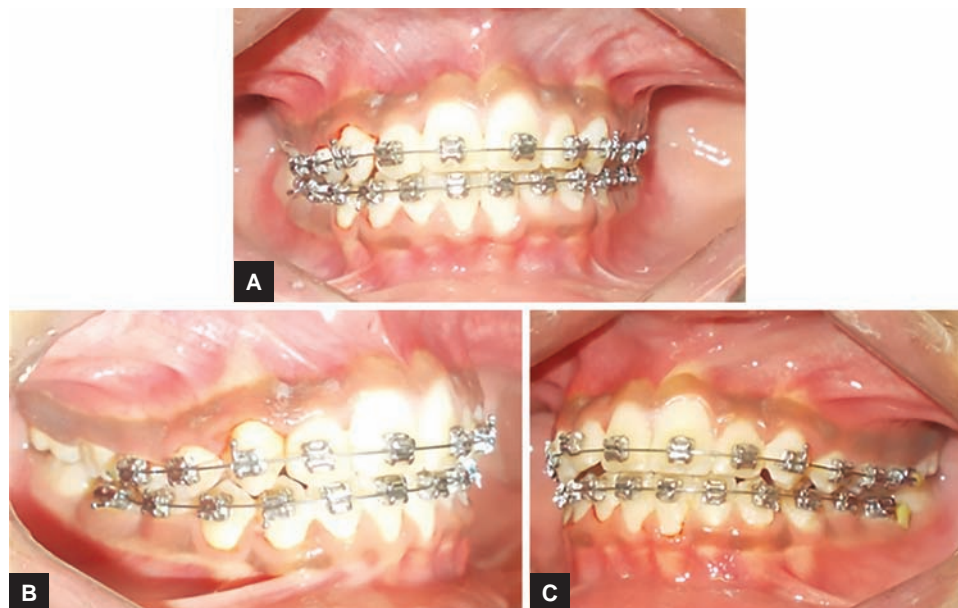
Treatment Plan

Construction of RPE

Working models were prepared along with bite registration so as to fabricate Hyrax screw-type expander for RPE splint covering maxillary posterior teeth, and buccal hooks were prepared for engagement of extraoral elastics.



Figs 5A and B: Midtreatment radiographs



Figs 6A to C: Fixed mechanotherapy to align and level arches

Delivery of RPE

Rapid palatal expander splint was cemented with zinc polycarboxylate cement, so as to make it fixed type. Routine expansion protocol of RPE followed as 2 quarter turns per day. This helped in loosening the circum-maxillary sutures and mid-palatine sutures too.

Rapid palatal expansion produced fast correction of maxillary bone width deficiency produced maxillary teeth midline diastema.⁶

Face Mask Therapy

Patient was instructed about wearing of removable face mask along with placement of extraoral elastics on the horizontal metal bar of face mask, so as to facilitate smooth maxillary protraction (Fig. 3).^{7,8}

The RPE splint along with posterior bite, flat type bite platforms ensured early correction of anterior cross-bite as patient compliance was excellent, i.e., mostly 16 to 20 hours per day of religious wear (Fig. 4). Early diagnosis, complete analysis, and utmost patient compliance made the entire process a joyful journey.

Fixed Mechanotherapy

After successful completion of orthopedic phase, regular records were obtained in terms of study models, photographs, and X-rays (Fig. 5).

MBT 0.022" fixed mechanotherapy (metal braces) was initiated for alignment and leveling of arches so as to have good intercuspation and closure of posterior bilateral open bite (Fig. 6).

CONCLUSION

- Cross-bite of dental origin is considered to be emergency in orthodontic treatment.
- Growing patients with predictable patient compliance can produce much optimal esthetic treatment (Fig. 7).
- In nongrowing patient, orthodontics camouflage has limited success and orthognathic surgery can be a big deterrent factor for such patients consenting for treatment.
- Hence, early mixed dentition and no skeletal dysplasia are bright candidates for predictable treatment of class III malocclusions.⁹



Figs 7A to H: Postoperative extra-oral and intra-oral photographs

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