

MANAGEMENT OF BIMAXILLARY POTRUSION REQUIRING EXTRACTION OF TEETH USING MBT TECHNIQUE : A CASE REPORT

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ABSTRACT

The case report describes the treatment of an 18 year old female girl who came to the Department of Orthodontics & Dentofacial Orthopedics in Dr. R Ahmed Dental College & Hospital, Kolkata, with class I molar relation & bimaxillary dentoalveolar protrusion. The orthodontic treatment included extraction of 1st premolars in all the four quadrants of her maxillary and mandibular dentitions followed by retraction using MBT SYSTEM. The total active treatment time was about 18 months. Her tooth alignment and profile were significantly improved by the orthodontic treatment. The 6 month posttreatment records show a stable occlusion and satisfactory facial esthetics.

KEY WORDS

Bimaxillary protrusion, Class I malocclusion, protrusive lip.

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INTRODUCTION

Convex facial profile, proclined anterior teeth, protrusive lips, inverted & everted lips are the characteristic features of bimaxillary dentoalveolar protrusion. Generally, bimaxillary protrusion is characterized by a Class I malocclusion with protrusion of both the maxillary and mandibular dentitions. It is common in almost all ethnicity. These types of malocclusion are more prevalent in African, American and Asian population⁽²⁾. In India it is more prevalent in Kerala population. Decreasing the protrusion and improving their facial profile and, consequently, facial esthetics are the reason why most of the bimaxillary protrusion subjects undergo treatment.¹⁻⁴

The treatment of bimaxillary protrusion is quite challenging and the condition can be satisfactorily corrected by orthodontic or surgical treatment or a combination of both⁷. Orthodontic treatment involves extraction of the first premolars followed by retraction of the anterior teeth with maximum anchorage consideration^{10,13}. However in a skeletal protrusion, repositioning of segments of the jaws surgically is required in conjunction with orthodontic treatment.^{3,4}

In most of the cases bimaxillary protrusion requires extraction of maxillary & mandibular first premolars for decreasing the proclination of teeth⁶⁻⁸ and incompetent & protruding lips to establish the esthetic harmony.

Macroglossia may result in bidental protrusion & spacing, in such situation the prognosis of orthodontic treatment is questionable.

Here, we present a case report on an 18 year old female girl with a Class I skeletal pattern and moderate bimaxillary protrusion that was successfully corrected using fixed mechanotherapy with MBT philosophy, following extraction of first premolars on all the four quadrants.

DIAGNOSIS

An 18 -year-old female girl with a convex facial profile came to the Department of Orthodontics & Dentofacial orthopedics in Dr. R. Ahmed Dental



Pre Treatment Extraoral Photographs

College & Hospital, Kolkata with a chief complaint of forwardly placed upper and lower front teeth. Her medical and dental history shows no previous maxillofacial or dental trauma or symptoms typically associated with the temporomandibular joint.

Her pretreatment facial photographs showed acute nasolabial angle with protruded upper & lower lip. Profile was convex. The chin was on the facial midline, and her face was apparently symmetric. Intraorally, her molar and canine relationships were considered Class I, with a 5-mm overjet and a 3mm normal overbite. There was a moderate curve of Spee of 1.5 mm on both sides. The dental midlines were aligned with the facial midline. All third molars were present.

Lateral cephalogram and an orthopantomogram radiographs were made. Radiographic image shows the absence of caries. The lateral cephalometric analysis (including a tracing) indicated a Class I skeletal pattern (ANB, 2 degree; Wits appraisal, 1 mm) with an average mandibular plane angle (SN-MP, 26 degree). The maxillary and mandibular incisors were proclined (U1-SN, 120 degree; IMPA, 107 degree), and the interincisal angle (95 degree). A diagnosis of bimaxillary dentoalveolar protrusion was made.

TREATMENT OBJECTIVES

The treatment objectives for this patient were as follows:

- Alignment & levelling
- Retraction of proclined upper & lower anterior teeth
- Establishment of ideal overbite and overjet
- Flattening of curve of spee
- Improvement of her facial profile and, consequently, esthetics
- Anchorage consideration using TPA and Lingual arch.

TREATMENT PROGRESS:

The patient was referred to a periodontist for oral prophylaxis and an oral and maxillofacial surgeon for the extraction of 1st premolars. Preadjusted appliances with 0.022 X 0.028-in slots were bonded to her teeth in both arches for leveling and alignment; 0.014-in, 0.016-in, 17X25 in, nickel-titanium archwires were used for leveling in the maxillary and mandibular arches, respectively. All the 2nd molars were banded.

After achieving alignment 19 X 25 SS archwire was placed as final wire with accentuated curve of spee in upper arch and reverse curve of spee in lower arch. Long crimpable hooks were placed respectively on the wires.

Retraction was done using active tie backs which were placed to the crimpable hooks from the 2nd molar hooks.



Pre Treatment Intraoral Photographs



Pre Treatment OPG



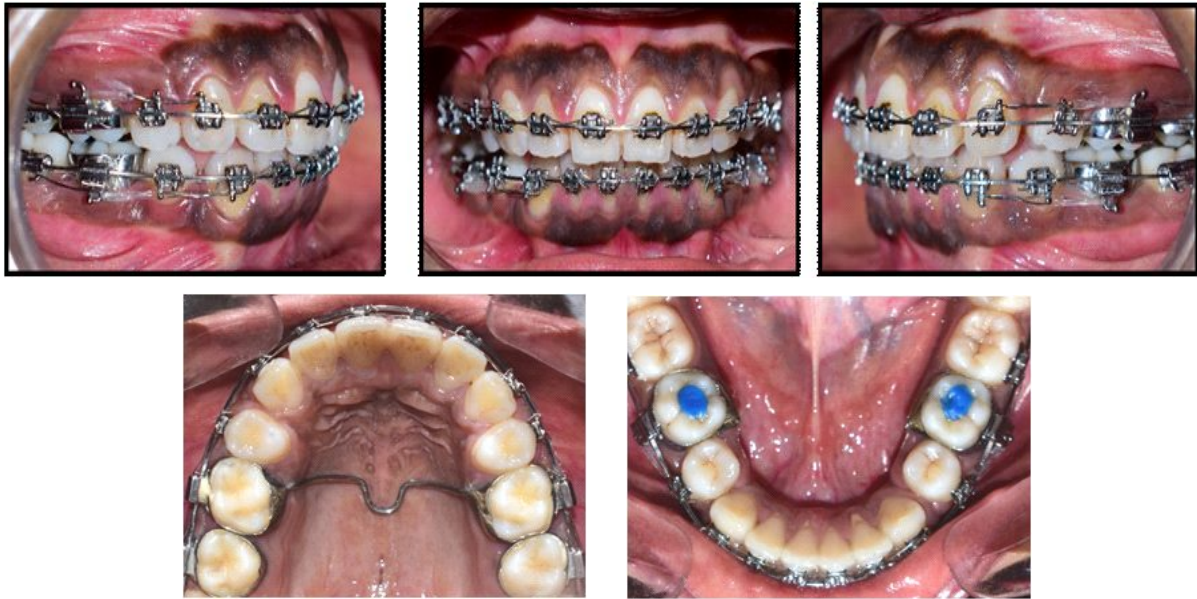
Pre Treatment Lateral Cephalogram



Transpalatal Arch (Tpa)



Lingual Arch



Retraction Stage

Parameter	Mean	Pre - Treatment	Present Treatment
Upper CI to A-Pog	+5 to -1 mm(2.7 mm)	11mm	8mm
Inter-incisal angle	130°-150°(134°)	95°	121°
Upper CI to NA (linear)	04mm	11mm	7mm
Upper CI to NA (angular)	22°	38°	27°
Upper incisor Protrusion	4-6 mm	11mm	7mm
Upper CI to SN	102°	120°	108°

Growth Pattern	Mean	Pre -Treatment	Present Treatment
Y (growth) axis	53°-66° (59.4°)	60°	60°
F M A	16°-35° (25° norm)	24°	24.5°
MPA (Steiner's)	32°	26°	27°
MPA (Down's)	17° to 28° (21.9°)	23°	23°
L A F H	Small 60-62 mm Medium 65-67 mm Large 70-73 mm	57mm	58mm
JARABAK's ratio	62% to 65%	67%	66.98%
Facial Axis Angle	0 ± 3.5°	+0°	0°

Parameter	Mean	Pre -Treatment	Present Treatment
Lower CI to NB (linear)	04mm	10mm	5mm
Lower CI to NB (angular)	25°	40°	27°
IMPA (Tweed)	76°-99° (90° norm)	107°	96°
Lower incisors Protrusion	1-3 mm	9mm	6 mm

Parameter	Mean	Pre -Treatment	Present Treatment
SNA	82°	82°	82°
SNB	80°	80°	80°
AB Plane to NPog	0° to -9° (-4.6°)	-3.5°	-2°
ANB	02°	2°	2°
Wit's Appraisal	-2mm to +2mm	+1 mm	+1mm
Pog -Na perp	Small -8 to -6mm Medium -4 to 0 mm Large -2 to +2 mm	-4 mm	-4mm
Na perp to point A	0-1 mm	0 mm	0 mm

Parameter	Mean	Pre - Treatment	Present treatment
Nasolabial angle	102° ± 8°	80°	95°
Facial angle	90°-92° (91 ± 7°)	90°	92°
H angle	10° (7°-15°)	25°	17°
Upper sulcus depth	5 mm	8mm	6mm
Lower sulcus depth	5 mm	3mm	2mm
Ricket's Lip analysis	Upper 4mm behind Lower 2 mm behind	+4 mm +6 mm	0 mm +4 mm
Steiner's Lip analysis	Lips behind - flat Lips anterior- protrusive	+6 mm +7 mm	+3 mm +4mm
Z- angle	80° ± 9°	52°	68°

After extraction space closure 0.014 SS arch wire was placed in upper & lower arch for finishing & detailing with occlusal settling using settling elastics.

Retention Protocol:

Fixed spiral retainer from 2nd premolar to 2nd premolar in both upper & lower arch.

TREATMENT RESULTS

The post treatment records showed that the treatment objectives were achieved. The facial photographs showed significant improvements in her facial profile and esthetics. The anterior proclination had decreased, and ideal overbite and overjet were established. Curve of spee was flattened. The Class I canine and molar relationships were maintained.

Extra Oral Pre Treatment



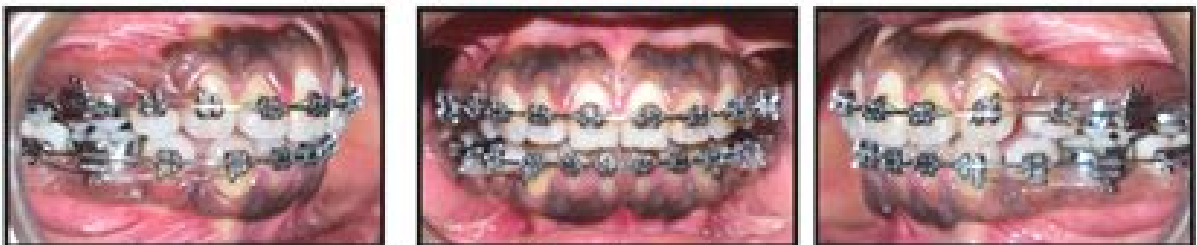
Extra Oral Post Treatment



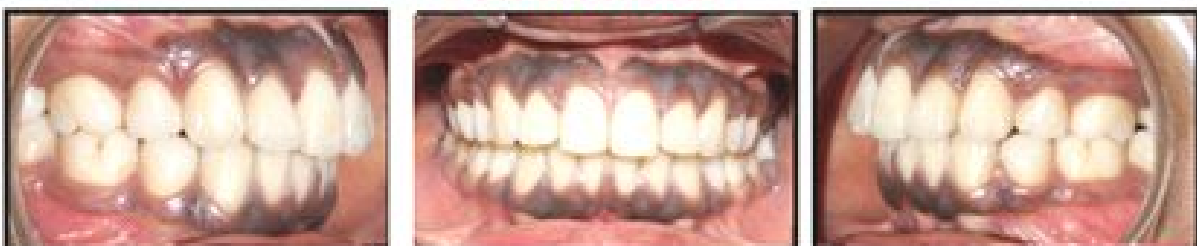
Pre Treatment

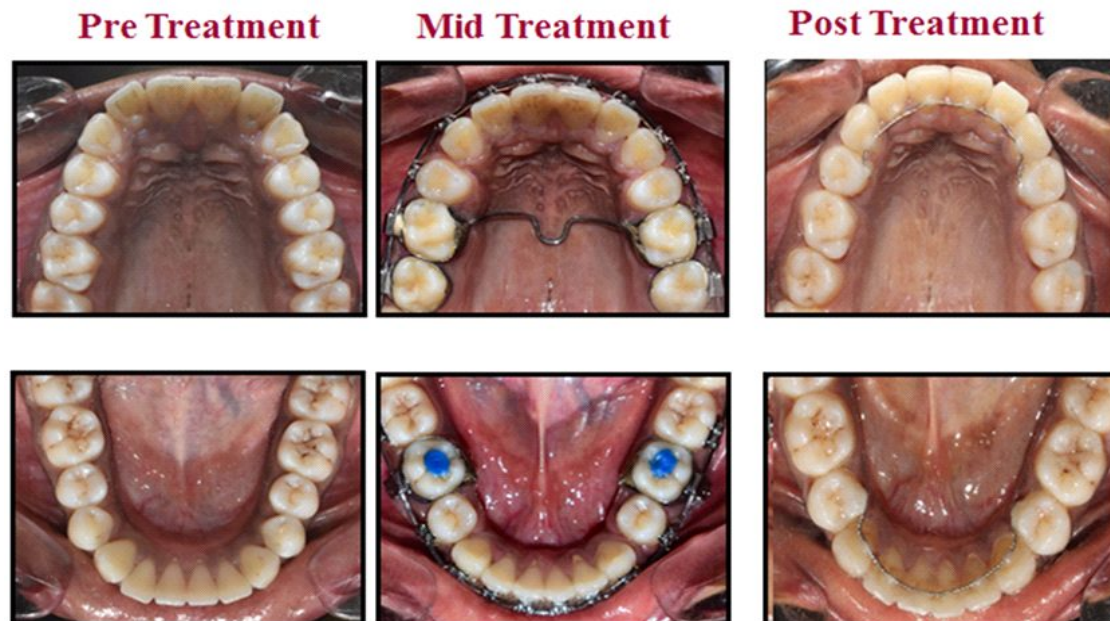


Mid Treatment



Post Treatment





PRE TREATMENT RADIOGRAPHS

POST TREATMENT RADIOGRAPHS

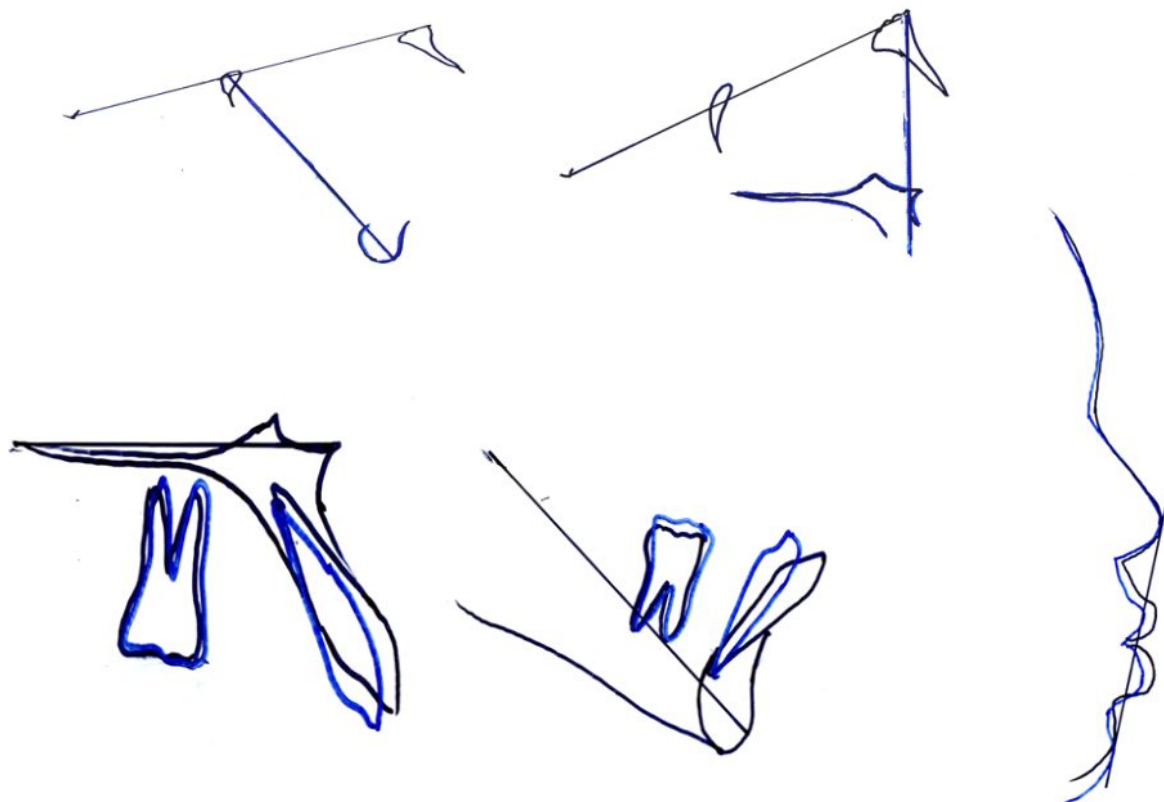
DISCUSSION

Patients with bimaxillary protrusion generally have Class I molar and canine relationships, it provides proper oral function. Facial esthetic is the prime concern why patients seek orthodontic treatment. Careful and complete skeletal, dental, and soft tissue evaluations are necessary before treatment planning. Treatment methods are guided by the patient's chief complaint and the clinical diagnosis.

A severe skeletal bimaxillary protrusion results when the patient presents with severely protruded lips

but upright maxillary and mandibular incisors. These patients should be managed by orthognathic surgery. Sagittal excess in the jaw bone is corrected by an anterior subapical osteotomy, whereas a segmental maxillary osteotomy corrects an exaggerated curve of Spee and vertical maxillary excess. For the treatment of an anterior open bite differential intrusion/impaction of the anterior and posterior maxillary/mandibular segments with clockwise rotation of the occlusal plane is a useful technique. A LeFort I osteotomy with setback sometimes provides an alternative to segmental maxillary osteotomy.

Bimaxillary protrusion characterized by severely



Cephalometric Superimpositions

proclined maxillary and mandibular incisors. They are generally corrected by orthodontic treatment alone. Extraction of the maxillary or mandibular first premolars done to provide the space for anterior tooth retraction. Maximum anchorage situations are believed to be the most critical part of the treatment plan. Studies present that extraction of the maxillary or mandibular first premolars are quite successful in decreasing dental and soft tissue protrusion in patients with bimaxillary protrusion. Although the molars cannot be kept stationary with conventional anchorage devices such as a headgear, the introduction of dental implants, miniplates, and miniscrews/implants as anchorage devices, it has become possible to achieve absolute anchorage. With the help of skeletal anchorage orthodontists utilize maximum extraction spaces and retract the anterior teeth as much as possible, increasing the chances of improved facial esthetics. Furthermore, the molars may be distalized to gain extra spaces to further continue anterior tooth retraction when the extraction space is not large enough to resolve anterior proclination. To the advantage of orthodontists, skeletal anchorage devices are introduced regularly to correct various types of malocclusion.

CONCLUSION

This case report demonstrates a traditional technique to treat bimaxillary dentoalveolar

protrusion using fixed mechano therapy with MBT philosophy following extraction of first premolars. With meticulous anchorage consideration (laceback, bendbacks, Transpalatal arch & lingual arch) from the initial stage bimaxillary protrusion cases treated with premolar extractions can be treated with classic MBT mechanotherapy successfully.

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