

# Microimplants as an absolute Anchorage for enmasse retraction in a Bimaxillary Protrusion case

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## ABSTRACT

In orthodontic practice one of the common clinical cases seen are of class I bimaxillary protrusion. To achieve optimum facial profile, in many cases anchorage is high and biomechanics is challenging. This case report presents a Class I high anchorage bimaxillary protrusion case, illustrating the use of micro-implants for anchorage during space closure. The case highlights how micro-implants can act as an absolute anchorage for en masse retraction of anterior teeth in high anchorage cases.

**KEYWORDS:** Microimplants, Bimaxillary Protrusion

## INTRODUCTION

One of the common presentation of a Class I malocclusion is bimaxillary protrusion impairing the facial profile. The bimaxillary proclination is a condition characterized by proclination of upper and lower incisors and an increased protrusion of the lips. Due to the negative perception of proclined dentition and lips in most cultures, many patients with bimaxillary proclination seek orthodontic care to decrease this protrusion.<sup>1</sup> Etiology of bimaxillary proclination is multifactorial and consists of a genetic component as well as environmental factors, such as mouth breathing, tongue and lip habits, and tongue volume. The goals of orthodontic treatment in a Class I bimaxillary protrusion case includes, reduction in proclination of maxillary and mandibular incisors with a resultant decrease in soft tissue protrusion and profile convexity. This is commonly achieved by the extraction of four first premolars followed by the retraction of anterior teeth using dental or skeletal anchorage devices.<sup>2</sup>

## CASE REPORT

A 17 year old female reported to the department of orthodontics and dentofacial orthopaedics with a chief complaint of forwardly placed upper front teeth. No relevant medical history was present. Patient had a leptoprosopic face with a convex facial profile, short upper lip, acute nasolabial angle, procumbent & incompetent upper lower lips with incisor display of 5-6 mm at rest. On intraoral examination the patient had Angle's Class I bimaxillary protrusion, mild crowding wrt maxillary anteriors. Dental health of the patient was good. On radiographic examination all 32 permanent teeth were present. Lateral cephalogram showed wits

appraisal of -2mm and ANB of 0°, indicative of slightly Class III skeletal jaw bases. FMA of 32° indicates a vertical pattern of growth. The patient had proclined maxillary and mandibular incisors (U1-NA 38°/10mm, L1-NA 38.5°/10mm, IMPA 104°) (Table 1) (Figure 1,2).

**Treatment Objectives:** The primary objective was to correct bimaxillary dental protrusion and convex facial profile. Treatment objectives for the occlusion were to maintain the molars in Class I, to achieve normal overjet, overbite.

**Treatment Plan:** Extraction of first premolars was planned to reduce the dental proclination and to achieve lip competency. Because the maxillary and mandibular incisors were excessively proclined and the patient exhibited lip strain on closure, group A anchorage using temporary anchorage devices (TADs) was needed to retract the incisors and prevent mesial movement of the maxillary and mandibular molars.

**Treatment progress:** MBT appliance 0.022 × 0.028" slots (Ormco, Glandora, CA) was used. Alignment and leveling were accomplished with the following sequence of archwires 0.014" nickel-titanium archwires, 0.016" NiTi archwires, 0.017×0.025" NiTi archwires, 0.019×0.025" NiTi archwires, 0.019×0.025" SS archwires. The archwires were cinched distal to molar to avoid maxillary and mandibular incisor proclination.

Spaces were closed using sliding mechanics on rectangular 0.019"/0.025" steel wires with hooks welded to the mesial of canines. The en masse retraction was accomplished by sliding mechanics using 9 mm NiTi coil spring on 0.019×0.025" stainless steel wire attached posteriorly to microimplants (SK surgicals, Pune). Four orthodontic self-drilling micro-implants, conical in shape

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with diameter of 1.5 mm and 8 mm length were placed into the buccal alveolar bone between the maxillary and mandibular first molars and second bicuspids. The NiTi coil spring delivered 150 grams of continuous force without any permanent deformation.

A 0.021×0.025" titanium molybdenum alloy wire was placed for two months for final torquing. Finishing and detailing was carried out by 0.021×0.025" braided stainless steel wire. After debonding, upper and lower Beggs retainers were given on the same day. The treatment was finished in eighteen months.

**Treatment Results**

- A Class I molar and canine relationship was maintained on both sides.
- Ideal overjet and overbite of 2 mm was achieved.
- The maxillary and mandibular dental midlines were coincident with one another and to the facial midline.
- Bimaxillary dentoalveolar protrusive profile of the patient was significantly reduced.



Figure 3: Retraction with implants as anchorage



Figure 4: Posttreatment Extraoral and intraoral photographs

Table 1. CEPHALOMETRIC FINDINGS			
Variable	Standard	Pretreatment	Posttreatment
<b>SKELETAL</b>			
SNA	82° ± 2	81°	79°
SNB	80° ± 2	81°	78°
ANB	2°	0°	1°
GO GN- SN	32°	39°	39°
Wits Appraisal	0mm	-2mm	-1mm
<b>DENTAL</b>			
U1-SN	102° ± 2°	119°	100°
U1-NA	4 Mm / 22°	10mm/38°	5mm/22°
L1-NB	4 Mm / 25°	10mm/38.5°	3.5mm/20°
IMPA	92° ± 5	104°	85°
<b>SOFT TISSUE</b>			
Nasolabial Angle	90°-110°	80°	100°
U Lip - Sline	0mm	+1mm	+0mm
L Lip - Sline	0mm	+6mm	+2.5mm

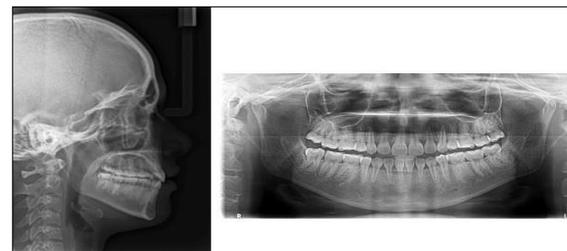


Figure 5: Posttreatment Lateral Cephalogram and OPG



Figure 1: Pretreatment Extraoral and Intraoral Photographs



Figure 2 : Pretreatment Lateral Cephalogram and OPG

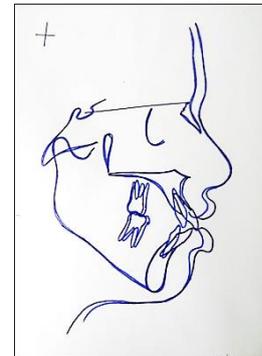


Figure 6: Pre and Post treatment superimposition

**DISCUSSION**

Bimaxillary proclination is common among various population groups, with most commonly affected groups being Asians and Americans of African descent.<sup>3</sup> It is characterized by severe proclination of anterior teeth of both the arches, with a resultant increase in lip protrusion. The treatment protocol includes extraction of first premolars to correct dental proclination and to reduce lip incompetency.<sup>4</sup> When premolars are extracted to correct the malocclusion, the treatment plan must account for the closure of extraction space. The main

challenge confronted by the orthodontist is anchorage maintenance, since mesialization of the posterior segment may compromise retraction of anterior teeth. The temporary anchorage devices (micro-implants) make it possible to overcome the previous limitation of anchorage loss during orthodontic tooth movement and perform en masse movement in the desired direction. As shown in the reported case, the use of micro-implants provided absolute anchorage for the desired tooth movement. With the use of micro-implants, maximum en masse retraction of the maxillary and mandibular anterior teeth was possible, without need of patient compliance based devices like headgear for anchorage preservation. However, total lip competency could not be achieved due to anatomically short upper lip.

## CONCLUSION

Microimplants can provide absolute anchorage for en masse retraction of the anterior teeth. Microimplants can simplify the treatment plan significantly in such

extraction treatment of Class I bimaxillary dentoalveolar protrusion.

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