

Case Report

Dentistry

# Facial Profile Enhancement and Occlusal Correction in Severe Class III Malocclusion Using Orthognathic Surgery: Case Report

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## Abstract

Class III malocclusion, resulting from mandibular prognathism, maxillary retrusion, or a combination, can severely affect function and facial aesthetics. While mild forms respond to orthodontic camouflage, severe skeletal discrepancies in adults usually require surgical correction. This report presents two adult cases treated with Le Fort I maxillary advancement and bilateral sagittal split osteotomy (BSSO) setback, followed by post-surgical orthodontic finishing to ensure occlusal stability and facial harmony. Orthognathic surgery not only corrected the skeletal disharmony and improved masticatory function but also enhanced patient self-esteem and quality of life, emphasizing the importance of coordinated orthodontic-surgical planning.

**Keywords:** Class III, Bi-jaw Orthognathic Surgery, mandibular prognathism, orthodontic-surgical treatment, case report.

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## INTRODUCTION

Class III malocclusion is a sagittal discrepancy between the maxillary and mandibular arches, with prevalence varying among populations higher in Asians (15–23%) and lower in American, European, and African Caucasians (<5%). [1] In Indian children (5–15 years), prevalence ranges from 0–4.76%. [2] In adults, Class III malocclusion presents unique challenges. Mild-moderate discrepancies with acceptable esthetics may be treated by orthodontic camouflage, while severe discrepancies necessitate orthognathic surgery. [3,4] Kerr *et al.*, [5] suggested that patients with ANB < -4° and an incisor mandibular plane angle < 83° require surgery. Eslami *et al.*, [6] proposed that borderline patients with Holdaway angle > 10.3° may be camouflaged, while those below need surgery. Similarly, Wits appraisal above -5.8 mm favors camouflage, while more severe discrepancies require surgery. Orthognathic surgery, combining orthodontics and maxillofacial procedures, is indicated where orthodontics alone cannot correct skeletal deformities. [7] It involves three phases:

presurgical orthodontics (dental decompensation), surgery (skeletal repositioning), and postsurgical orthodontics (occlusal refinement). The approach improves function, stability and facial harmony with proven esthetic and functional benefits.[8] This report presents two cases of severe skeletal Class III malocclusion managed with Le Fort I maxillary advancement and bilateral sagittal split osteotomy (BSSO) mandibular setback.

## CASE 1

An 18-year-old male reported to the Department of Orthodontics, PGIDS Rohtak, with the chief complaint of a forwardly placed lower jaw and difficulty biting with his front teeth. Medical and family histories were non-contributory. Extraoral assessment revealed a leptoprosopic face, collapsed paranasal areas, incompetent lips, increased lower facial height, and a concave profile with prominent chin, acute nasolabial angle, positive lip step, and increased mentocervical length. Malar depression was noted, with no dental

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midline deviation. Intraorally, bilateral Class III molar and canine relations, a -2.5 mm overjet, -2 mm overbite, facio-mandibular midline shift of 5 mm to right and a complete maxillary arch crossbite were seen. OPG Radiograph showed all third molars. Cephalometric analysis revealed a Class III skeletal base (retrognathic maxilla, prognathic mandible) with average growth pattern with CVMI stage 6. Dental findings included upper anterior proclination and lower retroclination. Soft tissue analysis showed retruded upper lip (-8 mm) relative to Ricketts' E-line, with an acute nasolabial angle of 73°. (Table 1, Figure 1A).

#### Treatment Objectives:

The goal was to establish facial harmony, correct skeletal discrepancy by maxillary advancement and mandibular setback, achieve positive overjet/overbite, ideal occlusion, and improve function while ensuring long-term stability.

#### Treatment Progress:

After interdisciplinary consultation, bimaxillary orthognathic surgery was planned. Phase I involved fixed orthodontics with MBT 0.022" prescription, extraction of bilateral upper first premolars for decompensation, and alignment and leveling with Group A anchorage. Six months prior to surgery, third molars were extracted. Stabilizing 0.019" × 0.025" stainless steel archwires were placed preoperatively (figure 1B) Phase II included Le Fort I osteotomy with 4 mm maxillary advancement and BSSO with 6 mm mandibular setback (Figure 3). Facebow transfer, semi-adjustable articulator mounting, and model surgery were performed; surgical splints guided intraoperative positioning. Postoperatively, intermaxillary elastics were used for 14 days, and the patient was placed on a soft diet initially. Phase III comprised postsurgical orthodontics, resumed four weeks after surgery to refine occlusion and establish class I canine and class II molar relations, positive overjet/overbite, and coincident midlines. Appliances were debonded after seven months (figure 1C and 1 D).

## RESULTS

Marked improvement was achieved in facial esthetics, smile arc, lip competence, and occlusal relationships with coincident midlines

## CASE 2

An 18-year-old male presented with the chief complaint of unaesthetic appearance due to forwardly placed lower jaw and teeth. No relevant medical or family history was reported. Extraorally, a mesoprosopic face, collapsed paranasal areas, incompetent lips (2 mm gap), concave profile, acute nasolabial angle, and positive lip step were observed. Facial and maxillary dental midlines were shifted 3 mm to the right, with malar depression. Intraoral findings included bilateral Class III molar and canine relations, -5 mm overjet, 0 mm overbite, anterior and posterior crossbite, and mandibular midline deviation of 5.5 mm to right side. OPG Radiographs showed all third molars (Figure 2A). Cephalometric evaluation indicated a skeletal Class III base with average growth pattern with CVMI stage 6. Upper incisors were proclined, and lower incisors retroclined. Soft tissue analysis revealed retruded upper lip (-8 mm) and protruded lower lip (+2 mm) relative to Ricketts' E-line, with nasolabial angle of 78° (Table 2, Figure 2A).

#### Treatment Objectives:

Identical to Case 1—skeletal correction, facial balance, functional occlusion, and long-term stability.

#### Treatment Progress:

Similar to Case 1, a combined orthodontic-surgical approach was planned. Presurgical orthodontics involved MBT 0.022" prescription, extraction of bilateral upper first premolars, and dental decompensation. Third molars were extracted six months prior. Stainless steel stabilizing wires (0.019" × 0.025") were placed before surgery. (Figure 2B) Surgical correction comprised Le Fort I osteotomy with 5 mm advancement of the maxilla and BSSO with 7 mm mandibular setback (figure 4). Preoperative model surgery and splint fabrication were performed. Postoperative care included intermaxillary elastic for 14 days and dietary modifications. Postsurgical orthodontics was initiated four weeks later, aimed at achieving class I canine and class II molar relationship correction of midline deviation, and optimal occlusion. Appliances were debonded after seven months (figure 2C, 2D).

**Table 1:**

		Normal	Pre-treatment	Presurgical	Postsurgical
Measurements	SNA	82°	76°	74°	80°
	SNB	80°	88°	88°	79°
	ANB	2°	-12°	-14°	1°
	Wits	0-1mm	-19	-22	-3
Skeletal	Angle of convexity	0°	-16°	-20°	5°
	SN-GOGN	32°	38°	39°	38°
	FMA	25°	25°	27°	30°
	IMPA	90°	70°	78°	78°
	1.NA	22°	45°	38°	27°

		Normal	Pre-treatment	Presurgical	Postsurgical
Dental pattern	1-NA	4mm	13mm	10mm	3.5mm
	1.NB	25°	7.5°	20°	13°
	1-NB	4mm	0.5mm	3mm	1mm
	1-1	135°	143°	137°	140°
Profile	U1-S	0mm	-5mm	-3.5mm	2mm
	L1-S	0mm	0mm	4mm	1.5 mm

**Table 2:**

		Normal	Pre-treatment	presurgical	Postsurgical
Measurements	SNA	82°	78°	75°	80°
	SNB	80°	85°	85°	77°
	ANB	2°	-7°	-10°	3°
	Wits	0-1mm	-15	-14	0
Skeletal	Angle of convexity	0°	-16°	-20°	5°
	SN-GOGN	32°	38°	39°	38°
	FMA	25°	30°	36°	30°
	IMPA	90°	80°	78°	77°
	1.NA	22°	33°	28°	28°
Dental pattern	1-NA	4mm	10mm	6mm	5mm
	1.NB	25°	25°	25°	23°
	1-NB	4mm	4mm	6mm	5mm
	1-1	135°	124°	131°	132°
Profile	U1-S	0mm	-3mm	-5.5mm	-3mm
	L1-S	0mm	4mm	3.5mm	1 mm

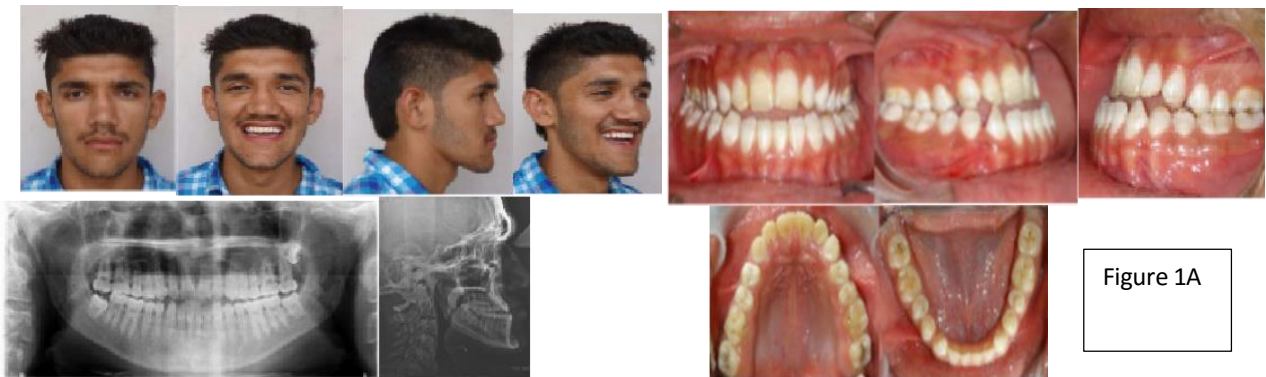


Figure 1A



Figure 1B





Figure 1C



Figure 1D



Figure 2A

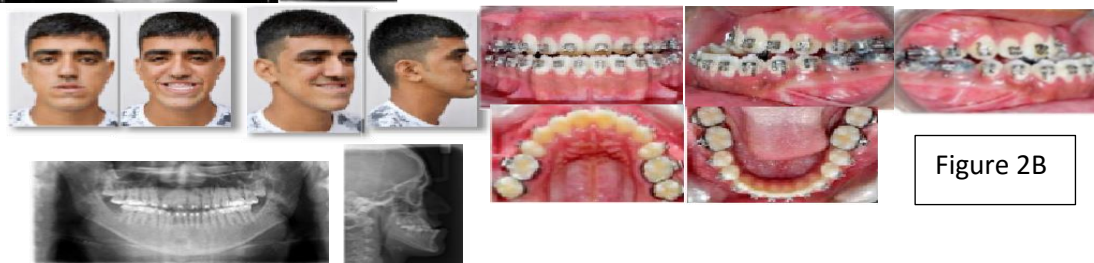


Figure 2B



Figure 2C

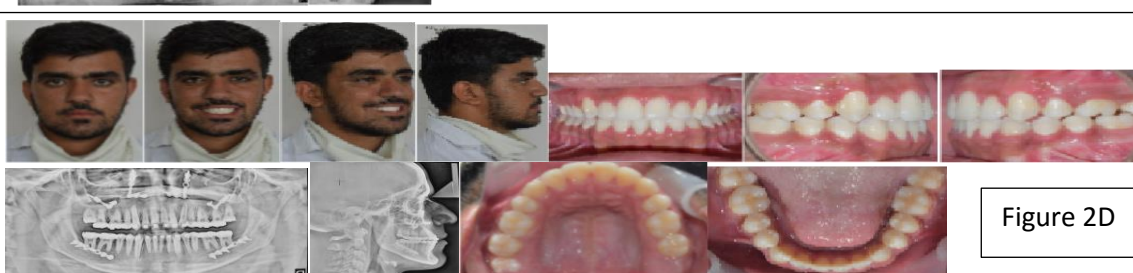


Figure 2D



Figure 3: Intraoperative procedure



Figure 4: Intraoperative procedure

## Results

Balanced soft tissue proportions, corrected midline deviation, positive overjet/overbite, and enhanced smile esthetics were achieved.

## DISCUSSION

This series demonstrates the efficacy of bimaxillary orthognathic surgery for severe Class III malocclusion. Extraction of upper first premolars allowed complete decompensation, essential for unmasking the true skeletal discrepancy; incomplete decompensation risks compromising surgical outcomes. Treatment proceeded in three phases: presurgical orthodontics for alignment and decompensation, surgical correction with Le Fort I advancement and BSSO setback, and postsurgical orthodontics for stable occlusion. Relapse remains a limitation, influenced mainly by mandibular setback magnitude and stretching of the pterygomasseteric sling, which exerts a forward pull. Large setbacks may also compromise airway space, predisposing to sleep-related breathing disorders.<sup>9</sup> Prior studies support these findings: Kobayashi *et al.*, observed relapse proportional to horizontal movement, Franco *et al.*, identified setback magnitude as the key determinant, and Politi *et al.*, reported greater relapse in discrepancies exceeding 7 mm [9]. Bimaxillary surgery, by distributing skeletal correction between the maxilla and mandible, reduces mandibular setback extent, improves stability and enhances both function and esthetics.

## CONCLUSION

Bimaxillary orthognathic surgery is an effective modality for severe skeletal Class III malocclusion unsuitable for camouflage. Addressing both maxillary deficiency and mandibular excess restores facial harmony, improves occlusion, and enhances esthetics. Successful outcomes depend on accurate diagnosis, interdisciplinary planning, and meticulous execution across orthodontic and surgical phases. Long-term

follow-up remains essential to monitor stability and patient satisfaction

**Declaration of patient consent-** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed

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