

Ortho-Surgical Management of Skeletal Class III Malocclusion – A Case Report

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ABSTRACT

Orthodontic preparation for surgical treatment of skeletal Class III malocclusion in an adult patient involves joint planning with an oral and maxillofacial surgeon to address the functional and esthetic needs of the patient. In order to allow surgical manipulation of the jaws in the preoperative phase, the need to achieve a negative overjet through incisor decompensation often leads the orthodontist to extract the upper first premolars. This report illustrates an orthognathic surgical case where extraction of upper first premolars are carried out to achieve normal inclination of upper incisors and bilateral sagittal split osteotomy and mandibular setback was done to achieve anteroposterior harmony.

Keywords: Skeletal Class III malocclusion, orthognathic surgey,mandibular set back.

INTRODUCTION

Skeletal class III malocclusion is one of the most challenging problems confronting the practicing orthodontists. Skeletal class III malocclusion may either be associated with maxillary retrusions, mandibular protrusion, or a combination of the two.^{1,2} These complex cases in adult patient require careful treatment planning and an integrated approach with oral and maxillofacial surgeon in order to address the esthetic needs and functional demands of the patient.³ Several distinct cephalometric features have been reported in class III patients, such as a short anterior cranial base length, acute cranial base angle, a short and retrusive maxilla, prognathic mandible, proclined maxillary incisors, retroclined mandibular incisors, an excessive lower anterior face height and obtuse gonial angle.⁴

In this case report, we present the treatment of an adult male patient with skeletal class III malocclusion on the account of Prognathic mandible.

DIAGNOSIS

A 19-year-old adult male patient reported with the chief complaint of forwardly placed lower front teeth and lower jaw. Clinical frontal examination revealed a grossly symmetrical face with mesoprosopic facial form with competent lips and half of the incisors could be seen on smiling. The profile assessment revealed concave profile with anterior facial divergence.

Intraoral examination revealed good periodontal health, crowding in the maxillary arch and minor crowding in the mandibular arch with Class III molar relation on both the sides. The maxillary midline was shifted to right by 2 mm and edge to edge bite was recorded. Crossbite bite was observed with respect to 12,43 and 22,32. **[Figure 1]** Temporomandibular joint examination did not reveal any discrepancy between centric relation and/centric occlusion and patient did not complain of pain or clicking in the joint.

Cephalometric examination revealed orthognathic maxilla, prognathic mandible, with horizontal growth pattern and proclined maxillary incisors and retroclined mandibular incisors. Soft tissue examination on lateral cephalograms revealed concave profile, acute nasolabial angle, increased upper lip thickness, and protrusive lower lip. A panoramic radiograph showed that all teeth were present including the third molars.**[Figure 2]**

Treatment Objectives

- Attain a pleasing profile by reducing the prominence of lower jaw
- To relieve anterior crossbite

- Alignment of both the arches with proper angulations of all the teeth
- Achieving acceptable static and functional occlusion

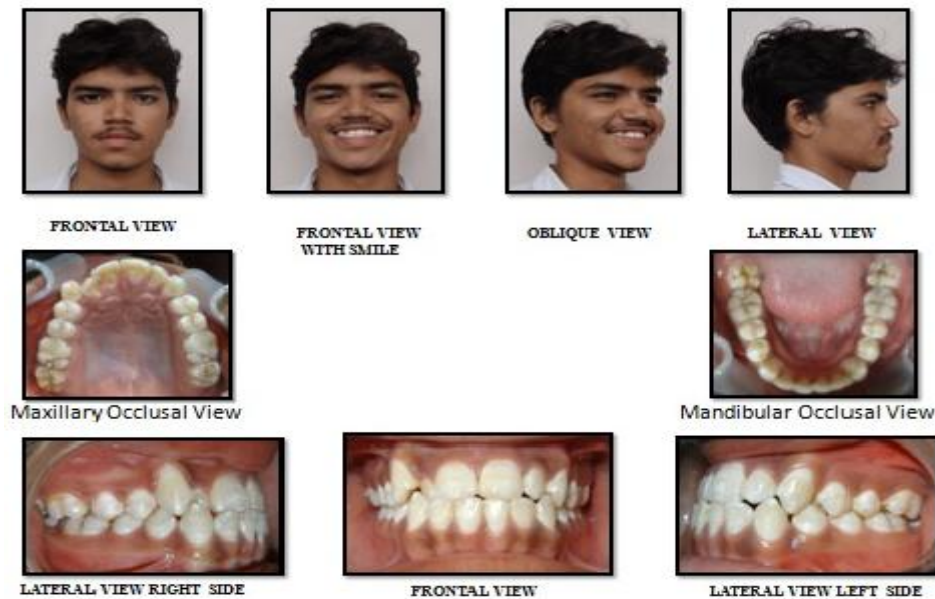


Figure 1: Pretreatment photographs

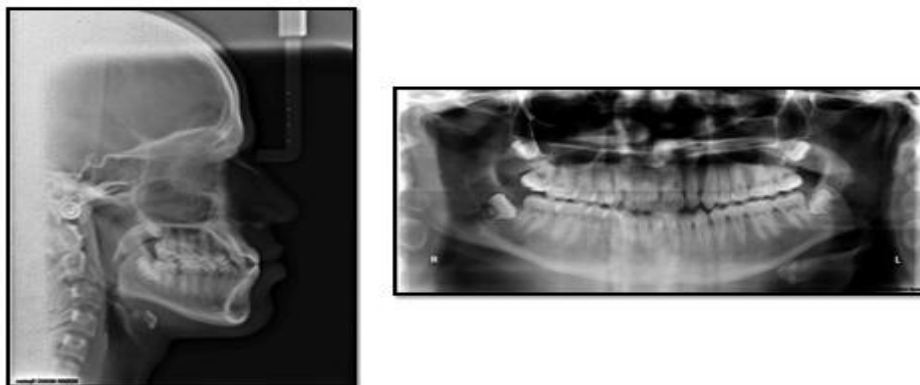


Figure 2: Pretreatment x rays

Treatment Plan:

- As per prediction tracing, on dental decompensation of the respective arches, reverse overjet was increased to 5 mm, mandibular setback being the first treatment option.
- This option was selected for the patient and was discussed with him before finalizing the treatment plan with Department of Oral and Maxillofacial Surgery of our college.

Treatment Progress

This will be discussed under three headings as follows:

- Presurgical orthodontic phase
- Surgical phase
- Postsurgical orthodontic phase.

Presurgical orthodontic phase

The presurgical phase was initiated with bonding brackets and banding first molars with 0.022 inch slot MBT preadjusted edgewise appliance. The extraction of upper bicuspid was carried out to decompensate maxillary anteriors and to create negative overjet. Space Closure was carried out using sliding mechanics with mini-implants. Before surgery upper and lower co-ordinated 0.019 inch × 0.025 inch stainless steel wires were left passively in place for 4 weeks following which presurgical records were taken. [Figure 3]

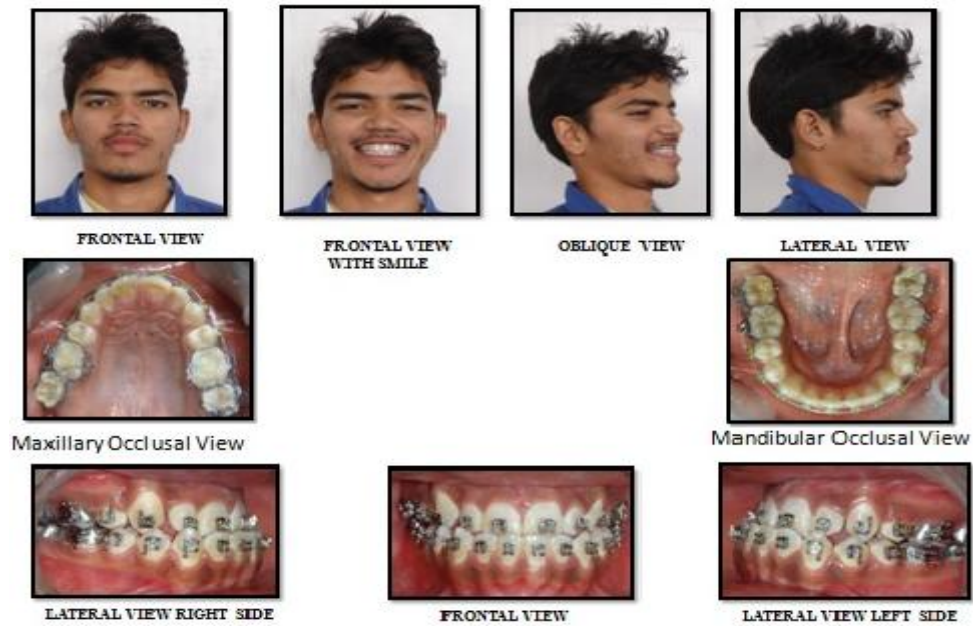


Figure 3: Presurgical photographs

The mock surgery was performed after mounting on semi adjustable articulator and set back was done on mandibular arch to evaluate postsurgical results.

Surgical orthodontic phase

The surgery was done in Department of Oral and Maxillofacial Surgery. During surgery, mandible was set back to achieve positive overjet. The mandible was stabilized with surgical bone plates that were placed at the osteotomy site. The intermaxillary fixation was done with the help of stabilizing wires.

Postsurgical orthodontic phase

Four weeks postsurgery, the stabilizing arch wires were removed. [Figure 4] Postsurgical leveling and final detailing was achieved with 0.014 inch stainless steel archwires and settling elastics. Total treatment time was 28 months. Patient was debonded and records were taken. The upper and lower retainers were fitted. Figure 5 shows debonded extraoral and intraoral photographs of the patient. Figure 6 shows radiographs of the patient taken before debonding.

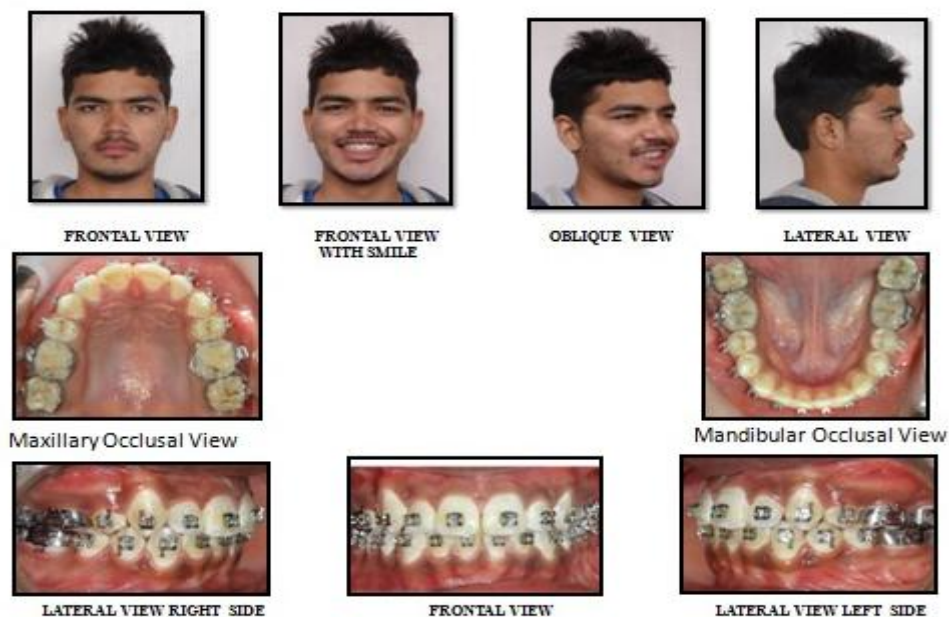


Figure 4: Postsurgical photographs

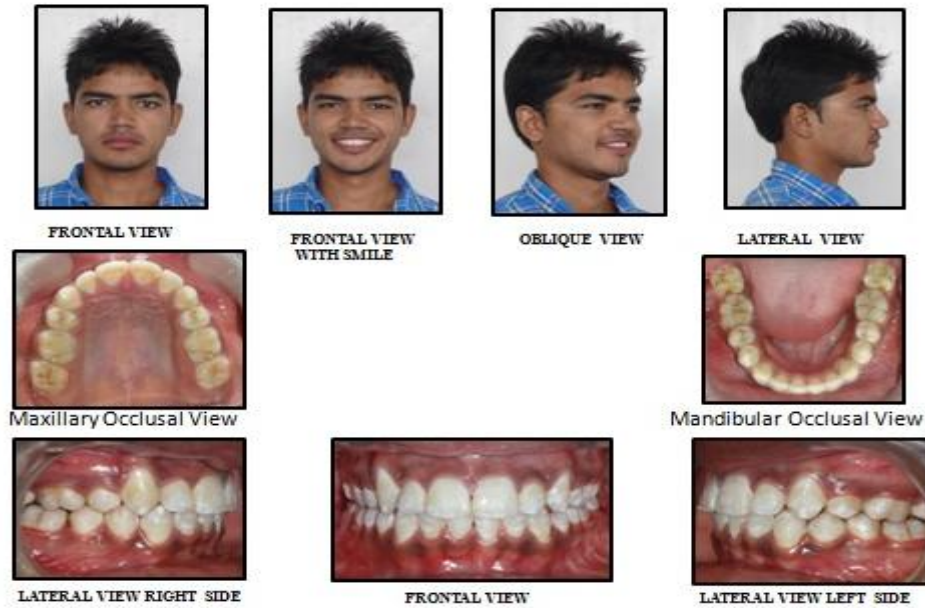


Figure 5: Postdebonded photographs

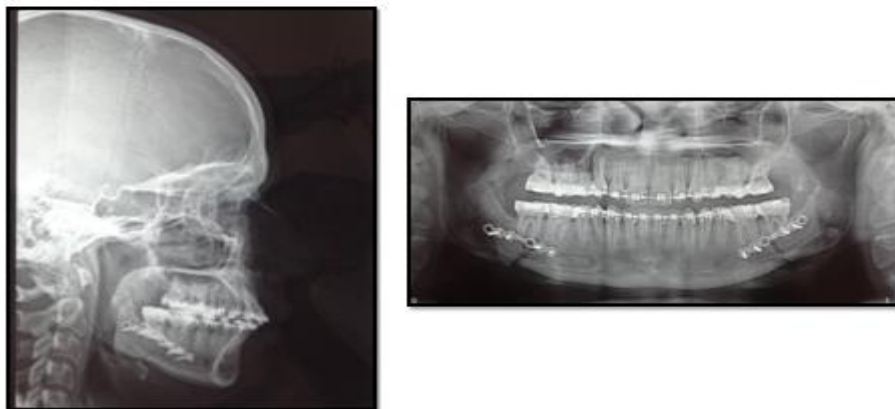


Figure 6: Postsurgical X rays

TREATMENT RESULTS

Most of the treatment objectives were achieved and facial esthetics definitely improved and lower lip attained normal profile anterior crossbite was corrected. **Figure 7** shows superimposition of stage radiographs.

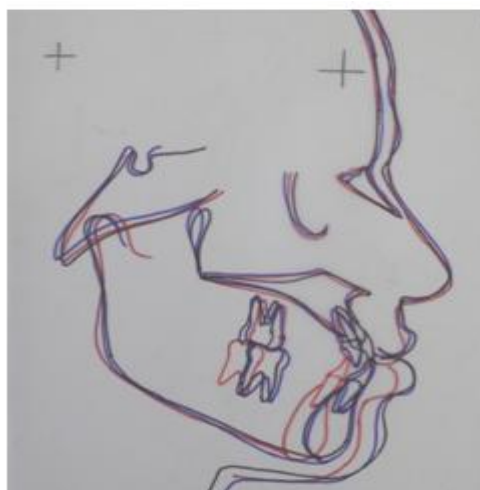


Figure 7: Superimposition of Pretreatment, Presurgical and Postsurgical Radiographs.

DISCUSSION

In cases of dentofacial deformity in adult patient in skeletal Class III malocclusion, orthosurgical approach is must. The final facial profile after surgery is of great significance as it results in a change in the appearance of the patient that can psychologically boost up or deteriorate his self-esteem. For this reason, diagnosis and proper treatment planning must be given added weightage.⁴⁻⁶

There is a paradigm shift in diagnosis with stress on soft tissue examination in whose light hard tissue deviations must be viewed.⁷

In this patient, extraction treatment approach was used presurgically so as to achieve alignment and leveling of the arches leaving less of correction to be done orthodontically during postsurgical phase. Clinically after surgery, patient should be satisfied, with normal static and functional occlusion, patient should be comfortable while chewing, and should possess stability of results achieved.

CONCLUSION

The carefully planned presurgical phase with skilfully done surgery and adequate detailing during postsurgical phase, keeping patients expectations in mind will bring desired results. An experienced multidisciplinary team approach ensures a satisfactory outcome.

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Table 1: Comparison of cephalometric findings

Parameters	Pretreatment	Pre-Surgical	Post-Surgical
Maxilla			
SNA (°)	81	81	81
N perp A	-2	-2	-2
ANS-PNS (mm)	61	61	61
Co-A (mm)	84	84	83
N-ANS (mm)	50	50	51
N-PNS (mm)	53	53	53
Mandible			
SNB (°)	87	87	81
N perp B	+7	+7	-4
N perp pog	+8	+8	-5
Co-Gn (mm)	113	113	103
Go-Pog (mm)	81.5	81.5	74
Sagittal Relationship			
ANB (°)	8.5	7	5.5
AO-BO	-6	-6	0
Vertical Relationship			
GoGn-SN (°)	27	27	29
FMA (°)	24	24	26

Y-axis	57	57	58
UAFH(mm) N-ANS	53	53	53
LAFH (mm)ANS-Me	67	67	69
Incisor Inclination			
1-NA (mm)	5	4	4
1-NA(°)	38	24	24
1-SN (°)	112	99	97
1-1 (°)	116	129	126
1-NB (°)	22	24	26
1-NB (mm)	4	4	4.5
IMPA(°)	92	95	97
Soft Tissue			
Nasolabial Angle(°)	88	96	96
Upper lip to E-line(mm)	-2.5	-2	-2
Lower lip to E-line(mm)	+2	+3	+1