

# AN ORTHODONTIC AND SURGICAL APPROACH TO TREAT AN ADULT CLASS-III SKELETAL MALOCCLUSION- A CASE REPORT

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## ABSTRACT

Orthognathic surgery is one of the treatment modality in adult patients in severe jaw discrepancies. It can be done in case of maxillary, mandibular or bi-maxillary deformity. A patient reported with a chief complaint of forward positioning of lower jaw. Pre-surgical orthodontic decompensation was done. Then prediction tracing and mock surgery was performed to detect the amount of setback to be needed. After that a surgical splint was constructed and the patient was referred to the Dept of Oral and Maxillofacial surgery for bilateral sagittal split osteotomy. After that the patient was referred back to the Orthodontic department for post surgical Orthodontics. Final settling was done. After that debonding was done and upper and lower canine to canine bonded retainer was given.

## KEYWORDS

**BSSO, Class III, open bite, cross bite**

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## INTRODUCTION

Skeletal Class III malocclusion is one of the challenging cases in the field of Orthodontics<sup>1,2</sup>. It can be treated by orthopedic appliance in growing stage or by dental camouflage or surgical approach if patients report after completion of growth. For surgical approach bilateral sagittal split osteotomy is the treatment of choice if there is problem in the mandible<sup>3</sup>. It can be done alone if there is only mandibular problem or with lefort I if there is deformity in the maxilla also. But before surgical approach pre-surgical orthodontics should be done for levelling and alignment and proper orientation of the teeth to the alveolar bone.

## CASE REPORT

A 23 years old male patient came to the Dept of Orthodontics with a chief complaint of forwardly placed lower jaw.

On extra oral examination it was found that the facial type was mesoprosopic with mild concave profile. Mid face was normal. Lower lip was protrusive. Face was anteriorly divergent.(Fig-1)

On Intra-oral examination it was found that the molars and the incisors were in class III relation. There was a negative overjet of 4 mm and open bite of 4mm. Right posterior segment and left first premolar were in cross bite. There was also minor crowding in lower anteriors.(Fig-1)

## DIAGNOSIS

The case was diagnosed as Angle's class III malocclusion with class III skeletal jaw base as indicated by ANB -4(Table-1) with anterior open bite.

## TREATMENT OBJECTIVES

The aim of the treatment was to correct

1. Anterior crossbite
2. Class III molar and canine relation
3. Anterior open bite
4. Posterior cross bite
5. Lower anterior crowding



**Fig1- Pre treatment intra and extra oral photographs**



**Fig2- Pre-surgical intra-oral photograph ( Orthodontic decompensation)**



**Fig 3- Immediate Post surgical intra-oral photograph**



**Fig4- Post treatment intra & extra oral oral photograph**

## TREATMENT OPTIONS

The various treatment options are

1. Use of class III elastics to correct class III situation
2. Use of box elastics to correct open bite
3. Orthodontic decompensation followed by surgery

Class III elastics may have further retroclined the lower incisors which would have been very unstable and unaesthetic. The chin would also remain prominent in case of class III elastics. So surgical approach was chosen for this case as it would help to achieve all necessary treatment objectives and was thus planned for this patient.

## TREATMENT PROGRESS

Treatment was carried out in pre-adjusted edgewise mechanics (MBT) in 0.022" slot started with 0.014" round NiTi wire followed by 0.016"

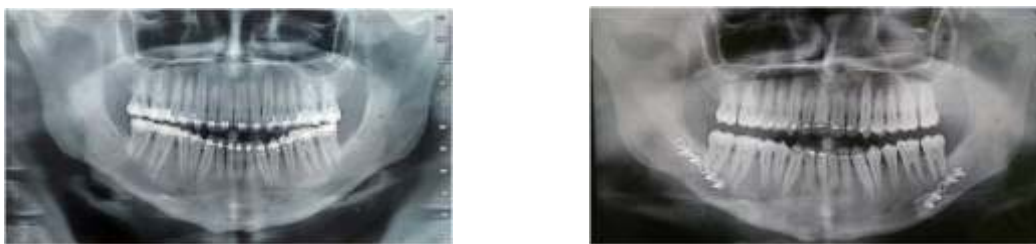
round Niti. Crowding was relieved. Then expanded upper 0.017"X0.025" SS wire was placed for correction of crossbite. The open bite was reduced a little due to flattening of the upper arch. Then finally 0.019x0.025" SS wires were placed for final root position (Fig-2). It took about 8 months for the whole decompensation process.

Prediction tracing and mock surgery were done. It was decided to set back the mandible by 5mm. Bilateral sagittal split osteotomy was planned for this case. After that a surgical splint was constructed and the patient was referred to Dept of oral and maxillofacial surgery for BSSO.

After surgery (Fig-3) the patient was referred back to Orthodontics Dept for post surgical Orthodontics. 0.014 " round SS wire was placed and settling elastics were started for proper intercuspation. After proper occlusal adjustment, debonding was done and fixed upper and lower canine to canine bonded retainer was given.(Fig-4)

Values	Pre- treatment	Post-treatment
ANB	-4 °	+1°
SNA	84°	84°
SNB	88°	83°
MP-FH	36°	33°
Gonial angle	137°	135°
U1 to NA	26°	27°
IMPA	85°	88°
Go-Pog	84 mm	80 mm
Ar-Go	49 mm	49 mm
N-ANS	49 mm	49 mm
ANS-Me	67 mm	65 mm
Upper lip to E line	-3 mm	-3 mm
Lower lip to E line	+1 mm	-2 mm

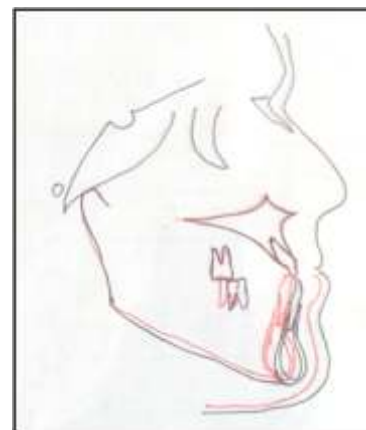
**Table-1 Cephalometric values**



**Fig-5 :Pre and post surgical OPG**



**Fig 6: Pre and Post surgical lateral cephalometric radiograph**



**Fig-7 Cephalometric superimposition**

## RESULTS

Cephalometric evaluation showed (Table-1) anti-clockwise rotation of mandible indicated by gonial angle that decreased 2 deg. SNB decrease from 88 to 83 deg. The lower facial height decreased by 2mm. The lower incisor got upright as indicated by IMPA 88 deg. Lower lip went backwards 3 mm as indicated by lower lip to E line. (+1 to -2 mm).

Positive overjet and overbite was achieved. Angle's class I molar and canine relation were established. (fig-4)The profile became straight from mild concavity.(Fig-4) There was improvement in lip position. Proper interdigitation of posterior segments was achieved.

## DISCUSSION

For skeletal class III in adult age it is always better for surgical approach for optimum facial esthetics. BSSO is the commonly performed surgical procedure for mandibular excess or deficiency. But before surgery if the dentition is not properly aligned, it is always better to go for pre-surgical orthodontics to facilitate surgical procedure and to minimize post orthodontic intervention. So in this case basic alignment was done starting from round NiTi to rectangular SS. Surgery was done to set back the mandible while taking care of the airway volume.<sup>4,5</sup>

As there is some amount of relapse after surgery it is always better to do some overcorrection<sup>2</sup>. Patient

was asked to wear the splint post surgery for preventing relapse. Proper occlusal settling in post orthodontic phase also minimizes this problem. So proper occlusal contacts were established with settling elastics. After that debonding was done and upper and lower canine to canine bonded retainer was given.

## CONCLUSION

Orthognathic surgery is a good treatment option for skeletal deformity in adult patients. It requires a team work by orthodontists, maxillofacial surgeons and to some extents prosthodontists for facebow transfer. It gives a more esthetic profile, a pleasing and well proportioned face and more social acceptance to the patients.

Conflict of Interest:

None.

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