

## ORTHODONTICSURGICAL TREATMENT OF A SKELETAL CLASS III MALOCCLUSION

<sup>1</sup> Viswapurna P S<sup>1</sup> Teaching faculty<sup>2</sup> Ahmed Al Hashmi<sup>2</sup> Teaching faculty<sup>3</sup> Mohammed Al Ismaily<sup>3</sup> Teaching faculty<sup>4</sup> Mohammad Zeinalddin<sup>4</sup> Teaching faculty<sup>1-4</sup> Department of Orthodontics, Oman Dental College, Muscat – Sultanate of Oman

**ABSTRACT:** The class III malocclusions are the difficult ones to treat. Depending upon the timing, severity and localisation of the discrepancy various treatment modalities are available for correction. A Skeletal Class III treated with orthognathic surgery is herewith presented in the article.

**Key words:** class III , malocclusion, BSSO, Orthognathic Suregry.

## INTRODUCTION

Class III malocclusion is one of the most difficult and complex orthodontic problems to treat. Prevalence of class III malocclusion in Caucasians ranges from 0.8 to 4.0% and rises up to 12.13% in Chinese and Japanese populations, while in Middle Eastern, class III malocclusion is found in up to 10.18% of the population.<sup>1-3</sup> Individuals with class III malocclusion frequently present with combinations of skeletal and dentoalveolar components. 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, proclined maxillary incisors, retroclined mandibular incisors, an excessive lower anterior face height and obtuse gonial angle.

Skeletal class III malocclusion may either be associated with maxillary retrusions, mandibular protrusion, or a combination of the two.<sup>4,5</sup> These complex cases require careful treatment planning, an integrated approach and patient cooperation.<sup>[6]</sup> A poor facial appearance is often the patient's chief complaint, but it may be accompanied by functional problems, temporomandibular disorders, or psychosocial handicaps.<sup>7</sup> In this case report, we present the treatment of an adult male with skeletal class III malocclusion. Pre and post surgical Orthodontics done at Oman Dental College and the Orthognathic surgery done by the Oral & Maxillofacial surgeons at Al Nahdha hospital, Muscat, Sultanate of Oman.

## Case Report

A 20-years-old Omani Male presented with the chief complaint of an unesthetic facial and dental appearance [Fig.1 and Fig.2]. He was greatly dissatisfied by his appearance specially when he smiled. He had a severe

class III malocclusion with 4.0 mm reverse overjet and minimum reversed overbite. The family had no history of skeletal class III malocclusion. When viewed from the front, the patient's face was oval. Lateral view and oblique view showed pronounced mandibular prognathism and midface deficiency with concave profile. Intraorally, the molar relationship was class III with a complete anterior crossbite

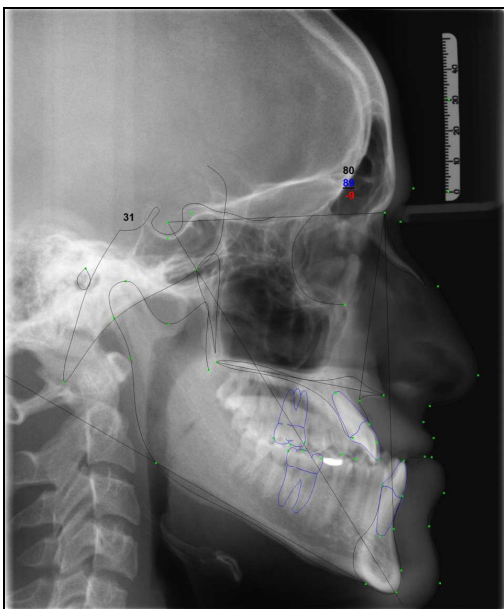
Cephalometric analysis [Table-1] showed maxillary deficiency and mandibular protrusion. The ANB angle was  $-9.4^\circ$ , suggesting a skeletal class III malocclusion. The skeletal problem was due to a combination of maxillary deficiency and mandibular prognathism [Fig.3].



Fig.1. Pretreatment extraoral facial views



Fig.2. Pretreatment intraoral views



**Fig.3.Pretreatment lateral cephalogram**



**Fig.4.Pretreatment orthopantogram**



**Fig.5.Presurgical lateral cephalogram**



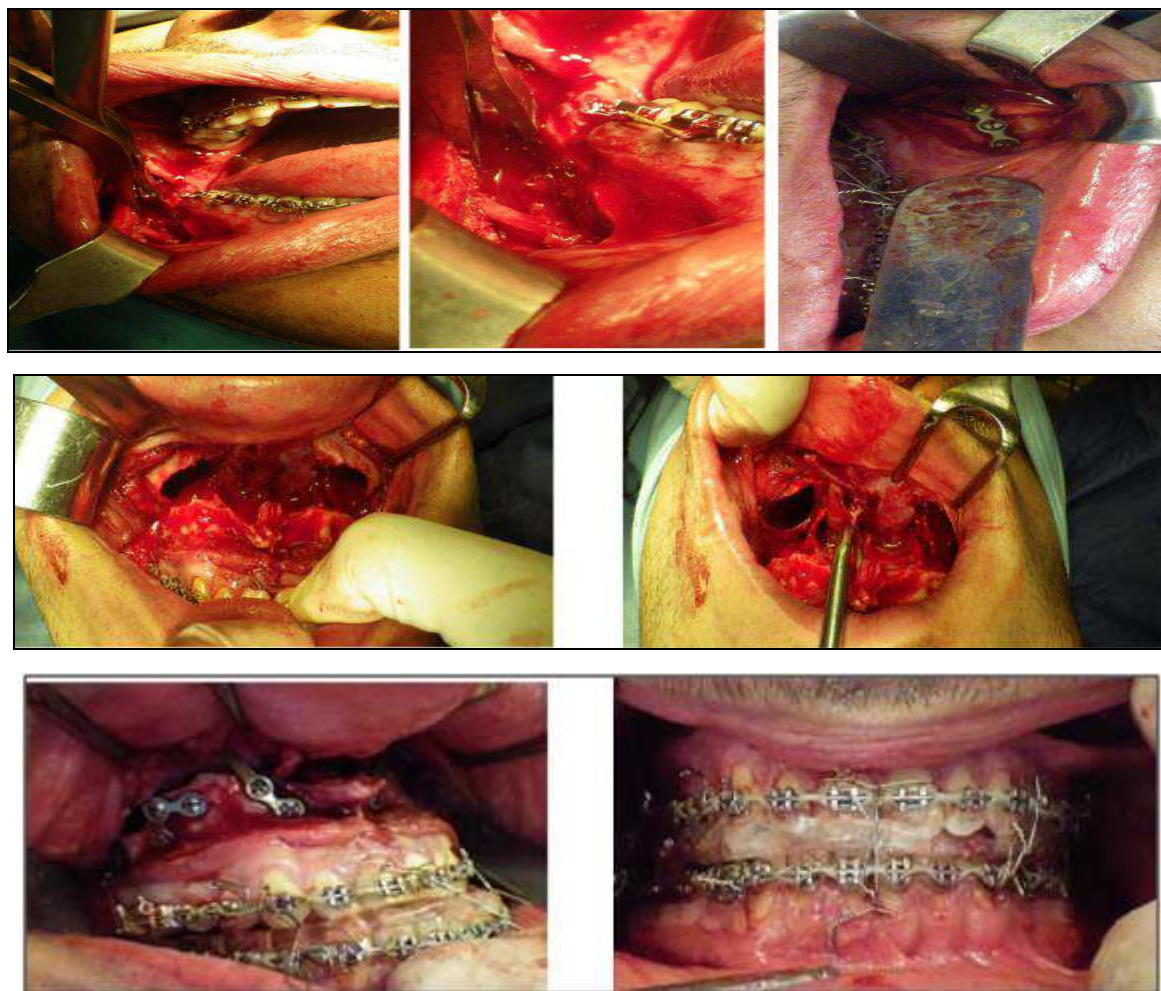
**Fig.6.Presurgical orthopantogram**

### Treatment

Bilateral sagittal split osteotomy with presurgical and postsurgical orthodontics was planned to achieve esthetically acceptable and functionally optimum occlusion with straight facial profile and minimum traumatic surgical exposure to the patient. Presurgical non extraction Orthodontics in both the arches was done to relieve maxillary and mandibular crowding. Maxillary and mandibular arches were aligned upto  $0.019 \times 0.025$

stainless steel wire with 0.022 slot edgewise appliances. The mandibular incisors were decompensated by proclining them in normal inclination and the archforms were coordinated.

After consultation with concerned Oral & Maxillofacial surgeons (OMFS) in Al Nahda hospital, 5.0 mm of mandibular setback & 7.0 mm of Maxillary advancement to bring his molars and canines into class I relationship with an esthetically pleasing profile decided [Fig.5].



**Fig.7.Surgical procedure; Maxillary advancement of 7.0 mm, Mandibular set back of 5.0 mm**

### Surgical procedure

Retromolar area was exposed using modified third molar incision. Bilateral sagittal split osteotomy with short lingual split was carried out using surgical saws. Medial pterygoid muscle was detached after performing the split and 5.0 mm setback was achieved. Mandibular 3<sup>rd</sup> molars also extracted during the surgery [Fig. 6].

Fixation was done using four hole miniplates and screws. Intermaxillary elastics were placed on braces for 14 days in immediate postoperative phase. The patient was followed closely after the procedure and was guided to perform opening and lateral movements. Orthodontic treatment was resumed 6 weeks after surgery. About a year later, fixed appliances debonded and a fixed lower retainer and removable upper Hawley retainer appliance was delivered [Fig. 8 and Fig. 9].

Patient's cooperation was excellent throughout the treatment. Post treatment cephalometric finding shows the normal jaw relationship [Table 1, Fig.11].



**Fig. 8.Postsurgical lateralcephalogram**

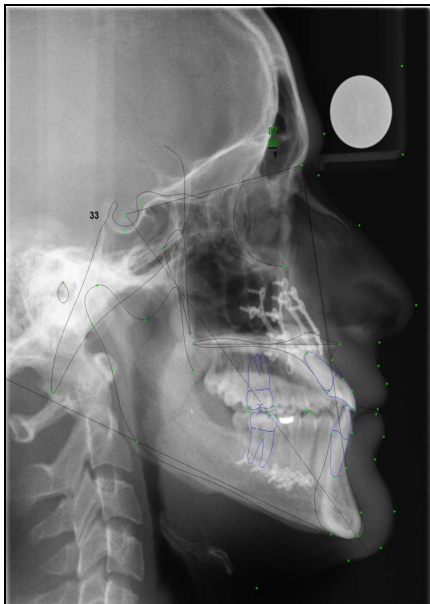




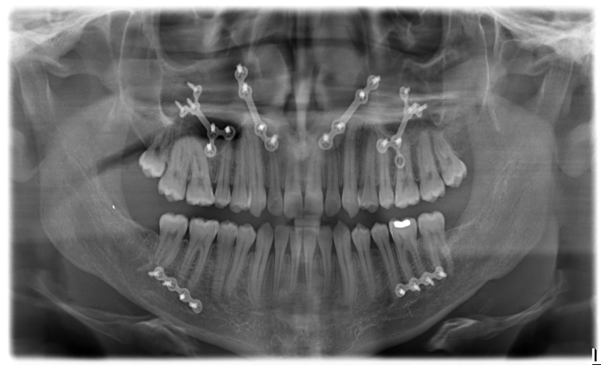
**Fig. 9. Post treatment extraoral facial view**



**Fig.10. Post treatment intraoral views**



**Fig.11. Post treatment lateral cephalogram**



**Fig.12. Post treatment orthopantogram**

## DISCUSSION

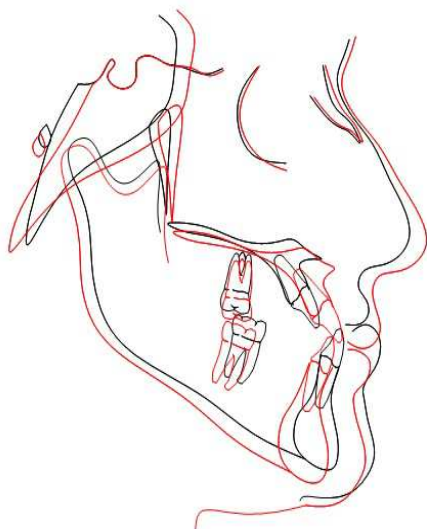
This case report describes the treatment of an adult Omani male patient with dental and skeletal class III relationships. Surgical–orthodontic treatment was the best option for achieving an acceptable occlusion and a good esthetic result in this case. Hence an experienced multidisciplinary team approach ensures a satisfactory

outcome. Presurgical orthodontics removes all the dental compensations and suggests the location and extent of the skeletal discrepancy. Normal skeletal base relationship is achieved by osteotomy and setback of the prognathic mandible and advancement of retrognathic maxilla, postsurgical orthodontics guides the normal occlusal rehabilitation by correcting any emerging dental discrepancies.

Table. 1. Cephalometric findings before and after surgery

VARIABLE	PRETREATMENT	POSTTREATMENT	NORMAL
SNA	79.7°	86.9°	82° ± 3
SNB	89.1°	86.4°	80° ± 3
ANB	- 9.4°	0.5	2° ± 1
SN to maxillary plane	13.5°	13.4°	8° ± 3
Wits appraisal	- 16.6 mm	- 8.1 mm	0 mm
Upper incisor to maxillary plane angle	134.2°	136.5°	110° ± 5
Lower incisor to mandibular plane angle	79.4°	81.6°	94° ± 5
Interincisal angle	129.3°	121.9°	132° ± 10
Maxillary mandibular plane angle	30.6°	33.4°	33° ± 5

(Sources of normal values: Jacobson (1975) Am J Orthod. 67:125-133, Houston WJB, Stephens CD & Tulley WJ (1992), Textbook of orthodontics. Wright, Oxford )



**Fig.13. Superimposition of pre- and post-treatment cephalometric tracings.**

(Digital Superimposition from Dolphin Imaging™ Software (Version 10.1))

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#### Corresponding Author

**Dr. P S Viswapurna**

Department of Orthodontics,  
Oman Dental College,  
Muscat – Sultanate of Oman

E-mail: [viswapurna@gmail.com](mailto:viswapurna@gmail.com)