

# SURGICAL - ORTHODONTIC TREATMENT OF CLASS II DIVISION 1 MALOCCLUSION IN AN ADULT PATIENT: A CASE REPORT

Amit Dahiya<sup>1</sup>, Minakshi Rana<sup>2</sup>, Hooda A<sup>3</sup>, Kumar V<sup>4</sup>

1.Senior Resident, Department of Orthodontics & Dentofacial Orthopaedics, Post Graduate Institute of Dental Sciences (Rohtak)

2. Post-Graduate Student, Department of Periodontology, Manav Rachna Dental College, Faridabad (Haryana)

3.Senior Professor & Head, Department of Oral Anatomy, Post Graduate Institute of Dental Sciences, Rohtak.

4.Post-Graduate Student, Department of Oral and Maxillofacial Surgery, Post Graduate Institute of Medical Education And Research, Chandigarh

## ABSTRACT:

Correction of skeletal deformities in adult patients with orthodontics is limited. Orthognathic surgery is the best option for cases when camouflage treatment is questionable and growth modulation is not possible. This case report illustrates the benefit of the team approach in correcting a class II skeletal deformity. A cosmetic correction was achieved by mandibular advancement with bilateral sagittal split osteotomy (BSSO) along with orthodontic treatment. The patient's facial appearance was markedly improved along with functional and stable occlusion.

**Key words:** Retrognathic mandible, Class II div.1 malocclusion, Orthognathic surgery

## INTRODUCTION:

Surgical-orthodontic treatment is universally recognized as the best therapeutic option for the adult patient with maxillofacial disharmony from both dental and skeletal perspectives [1]. Facial appearance is an important factor in determining social relationships and improving their self-confidence [2]. The envelope of discrepancy for the maxillary and mandibular arches in three planes of space determines the treatment plan by orthodontic or by orthognathic correction [3]. Surgical intervention to reposition the jaws and dento alveolar segments

becomes the only option to treat patients with severe skeletal deformity where growth modulation is not possible and camouflage treatment is questionable [4]. Considering the limitations of the orthodontic treatment for severe skeletal deformity combined orthodontic and surgical treatment was planned, which resulted in a stable outcome.

## CASE DETAIL:

A 26 year old male patient with the chief complaint of coming out of coming out of upper front teeth reported to the Department of Orthodontics and

\*Corresponding Author Address: Dr. Amit Dahiya, Senior Resident, Department of Orthodontics & Dentofacial Orthopedics, Post Graduate Institute of Dental Sciences, University of Health Sciences, Rohtak (Haryana) 124001 Email: amitdahiya0909@gmail.com

Dentofacial Orthopedics, Post-Graduate Institute of Dental Sciences (PGIDS), Rohtak.

Initial examination revealed a skeletal and dental Class II malocclusion with a retrognathic mandible, a severe overjet (14 mm) and overbite (6 mm) with a mild malalignment of both arches (Fig .1). The patient had a history of trauma to the maxillary right central incisor which was root canal treated as confirmed by the panoramic radiograph (Fig. 2). The maxillary dental midline was matching with the mandibular dental midline. The patient was healthy and no sign and symptoms of temporomandibular disorder were noted.

Clinically, profile view showed a convex profile (Fig.3), facial type was hypodivergent, adequate nasolabial angle, reduced lower anterior facial height and a deep mentolabial sulcus. Cephalometric analysis revealed a Class II, division 1 skeletal malocclusion ( $ANB = 5.5^\circ$ ) with a low mandibular plane angle ( $GoGn-SN = 15^\circ$ ), reflecting a low-angle facial pattern. Maxilla was normal ( $SNA = 81^\circ$ ), while the mandible was retrusive ( $SNB= 75.5^\circ$ ,  $ANB = 5.5^\circ$ ).

#### **TREATMENT OBJECTIVES**

1. Attaining a pleasing profile by improving the relationship of jaw bases.
2. Correction of overjet and overbite.
3. Correction of individual tooth malpositions.

#### **TREATMENT PLAN**

A presurgical orthodontic phase was started to align the arches using extraction of a lower single incisor and correct the individual teeth malposition. At the end of the pre surgical phase an increased overjet was achieved (Fig.4a-4e and Fig 5a-5e). Bilateral sagittal split osteotomy (Fig.6a-6f) was planned for 9 mm of mandibular advancement which was to be followed by short phase of post surgical orthodontics to achieve final desired tooth intercuspation.

#### **TREATMENT PROGRESS**

The pre-surgical phase was initiated using a 0.022 slot pre-adjusted edgewise appliance using a MBT prescription. The maxillary and mandibular arches were aligned using 0.016 Ni-Ti arch wire which were followed progressively by heavy arch wires like 0.016 SS, 0.018 SS, 0.017 X 0.025 SS arch wires. The closure space closure for the extracted mandibular incisor was done using 0.019 x 0.025 SS arch wires. Final arch wires prior to surgery were 0.019 x 0.025 SS arch wires. A bilateral sagittal split osteotomy was performed to advance 9 mm of mandible on both the sides using a splint. Post surgical phase was done using settling elastics to inter-digitate the individual teeth wherever required. At the end of the treatment all ceramic crown was placed on the root canal treated maxillary right central incisor along with fixed bonded lingual retainers in the maxillary and the mandibular arches (Fig. 7a-7e).

## RESULTS:

Most of the treatment objectives were achieved as shown by the cephalometric changes (Table no.1). Post treatment radiographs showed a marked improvement in the skeletal base relationship (Fig.8a-8b). There was a marked improvement in facial esthetics (Fig.9a-9d). Increased overjet was corrected, molar and canine relationship was corrected to Class I. Both maxillary and mandibular arches were aligned.

## REFERENCES:

1. Farronato G, Maspero C, Giannini L, Farronato D. Occlusal splint guides for presurgical orthodontic treatment. *J Clin Orthod.* 2008 Sep;42(9):508-12.
2. Shaw WC, Rees G, Dawe M, Charles CR. The influence of dentofacial appearance on the social attractiveness of young adults. *Am J Orthod* 1985;87:21-6.

## CONCLUSION:

Orthognathic surgery is a possible option in patients with severe skeletal deformities. Treatment planning according to the level of discrepancy ensures stability and good outcome. The patient has reported a greater degree of pleasure related to his appearance.

3. Thomas M Graber, Robert L Vanarsdall, Katherine W.L. *VIG Orthodontics Current Principles and Techniques.* 4th ed. Elsevier 2005.
4. Abraham J, Bagchi P, Gupta S, Gupta H, Autar R. Combined orthodontic and surgical correction of adult skeletal class II with hyperdivergent jaws. *Natl J Maxillofac Surg* 2012;3: 65-9.

## FIGURES:



**Fig. 1 (a)**



**Fig. 1 (b)**



Fig. 1 (c)



Fig. 1 (d)



Fig. 1 (e)



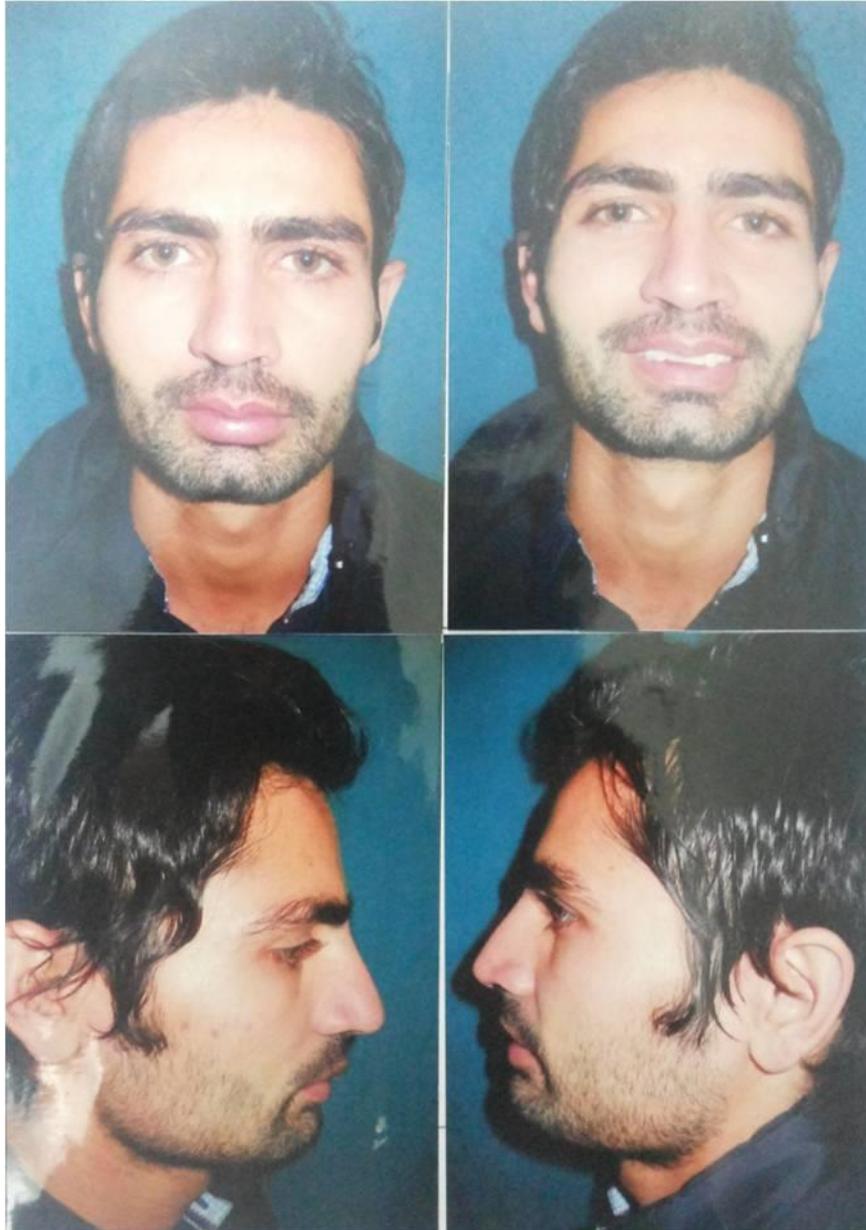
Fig. 2 (a)



Fig. 2 (b)

Fig . 2 Pre-treatment radiographs.

Figure 1: Pre-treatment intra-oral photographs.



**Fig . 3** Pre-treatment extra-oral photographs.



**Fig 4 (a)**



**Fig 4 (b)**



Fig 4 (c)



Fig 4 (d)



Fig 4 (e)

Fig . 4 At the end of pre-surgical phase- Intra oral photographs.



Fig 5 (a)



Fig 5 (b)



Fig 5 (c)

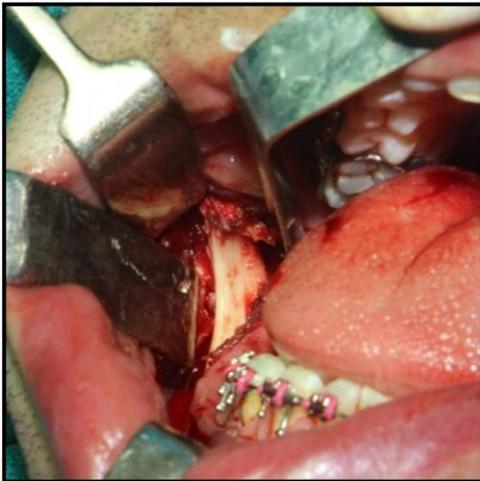


**Fig 5 (d)**

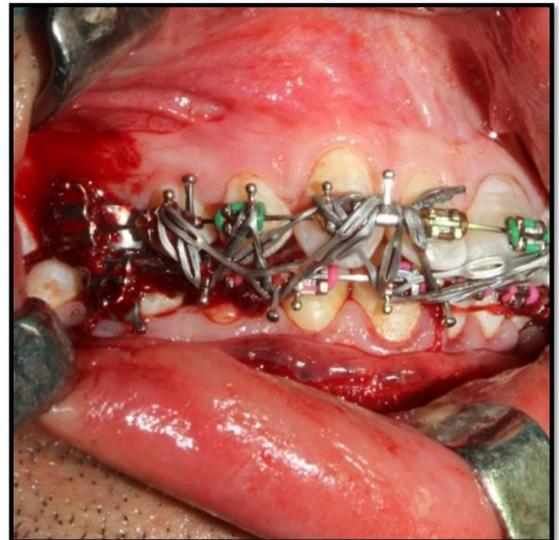
**Fig. 5-** At the end of pre-surgical phase -Extra oral photographs



**Fig 6 (c)**



**Fig 6 (a)**



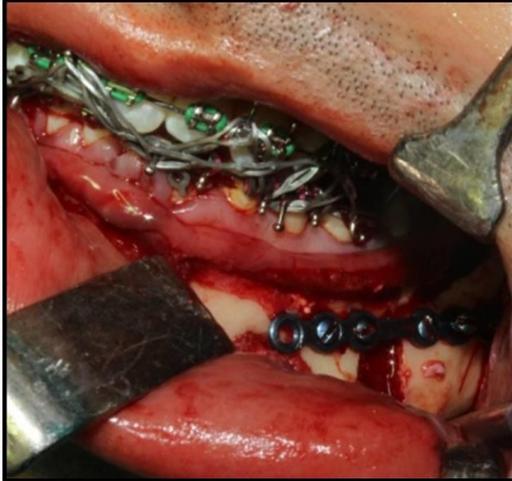
**Fig 6 (d)**



**Fig 6 (b)**



**Fig 6 (e)**



**Fig 6 (f)**  
Fig . 6: Intra-operative photographs- 6(a-b) Osteotomy cuts, 6 (c-d) Inter maxillary fixation of the segment in planned position, 6(e-f) Fixation of the segments.



**Fig 7 (c)**



**Fig 7 (d)**



**Fig 7 (a)**



**Fig 7 (e)**

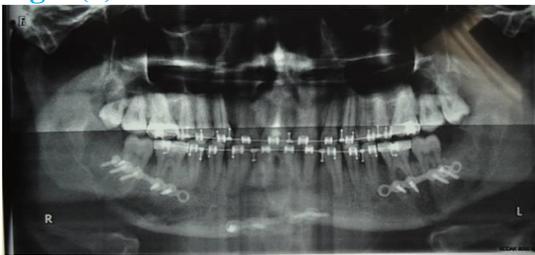


**Fig 7 (b)**

**Fig 7. Post-treatment intra-oral photographs.**



**Fig 8 (a)**



**Fig 8 (b)**

**Fig . 8 Post-treatment radiographs.**



**Fig 9 (b)**



**Fig 9 (c)**



**Fig 9 (a)**



**Fig 9 (d)**

**Fig 9. Post-treatment extra-oral photographs**