



## CASE REPORT

# Correction of Class II Malocclusion with Skeletal Deep Bite

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## ABSTRACT

Correction of skeletal deformities in adult patients with orthodontics is limited. In adult severe cases, the combined approach, orthodontic and orthognathic surgery, is always the treatment of choice, and the results obtained usually ensure a better esthetics, functionality, and stability. 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 mandible retrusion along with class II skeletal deformity with 100% deep bite. Insertion of fixed functional appliance was not possible due to prominent root apices and thin mandible cortical plates. Correction was achieved by anterior repositioning of mandible osteotomy along with orthodontic treatment. The patient's facial appearance was markedly improved along with functional and stable occlusion.

**Keywords:** Camouflage, Orthognathic, Skeletal.

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## INTRODUCTION

Today's orthodontics not only gives importance to esthetics and function, but also to establish harmony between craniofacial structures.<sup>1</sup> Facial appearance is an important factor in determining social relationships and improving their self-confidence.<sup>2</sup> Class II div 2 malocclusion is commonly seen in orthodontics with 100% deep bite as the major problem from the patient's perspective. The envelope of discrepancy<sup>3</sup> for the maxillary and

mandibular arches in the three planes of space determines the treatment plan by orthodontic or by orthognathic correction. Surgical intervention to reposition the jaws and dentoalveolar segments becomes the only option to treat patients with severe skeletal deformity where growth modulation is not possible and camouflage treatment is questionable.<sup>4</sup> 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 REPORT

The present case report is about a 17-year-old male patient who came to the Department of Orthodontics with a chief complaint concerning the position of the maxillary incisors, displaced too palatally, and an impaired facial profile.

### Extraoral Examination

This case report describes the orthodontic treatment of a boy, aged 17 years, with permanent dentition, mesofacial typology, affected with a severe sagittal skeletal class II div 2 malocclusion, due to a mandibular retrusion.

Frontal examination showed lip competence and crown exposure during smile only and no gingival display during smile. Profile was convex with posterior divergence and decreased lower anterior facial height. Clinical Frankfort mandibular plane angle was low and chin was retruded, with acute nasolabial angle (Figs 1A to C). Normal breathing, deglutition, and speech were diagnosed on functional examination.

Intraoral examination revealed U-shaped arches with bimaxillary dentoalveolar retroclination of upper and lower anteriors. Lower incisors showed mild crowding with exaggerated Curve of Spee. The patient had class II molar and canine relation on both sides with overjet of 1 mm and overbite of 10 mm (Figs 2A to C and 3A, B).

Cephalometric examination revealed class II skeletal base due to orthognathic maxilla and retrognathic mandible. Horizontal growth pattern was present with decreased lower anterior facial height and decreased mandibular plane angle. Dentoalveolar analysis showed retroclined upper and lower anterior. Soft-tissue analysis indicated no lip strain and retrusive lower lip

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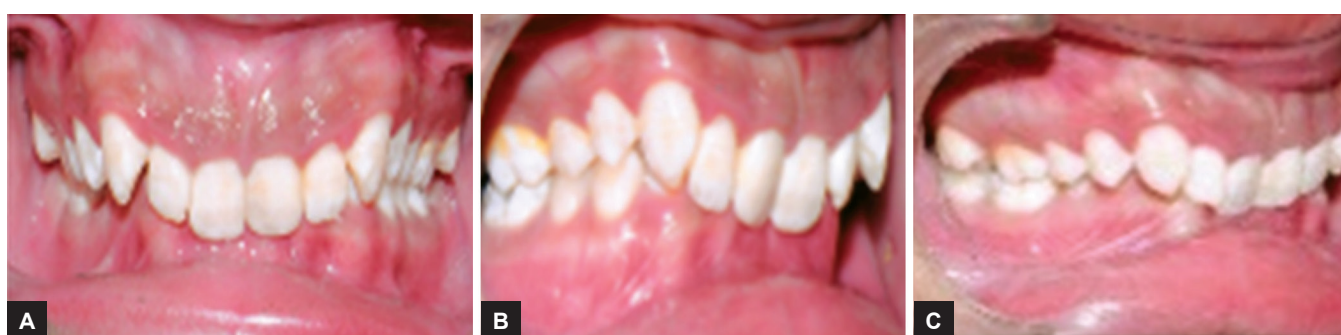
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Figs 1A to C: Pretreatment extraoral view



Figs 2A to C: Pretreatment intraoral view



Figs 3A and B: Pretreatment occlusal view

(Figs 4A and B). Space analysis showed no space discrepancy in the upper arch and 4 mm in the lower arch.

### DIAGNOSIS

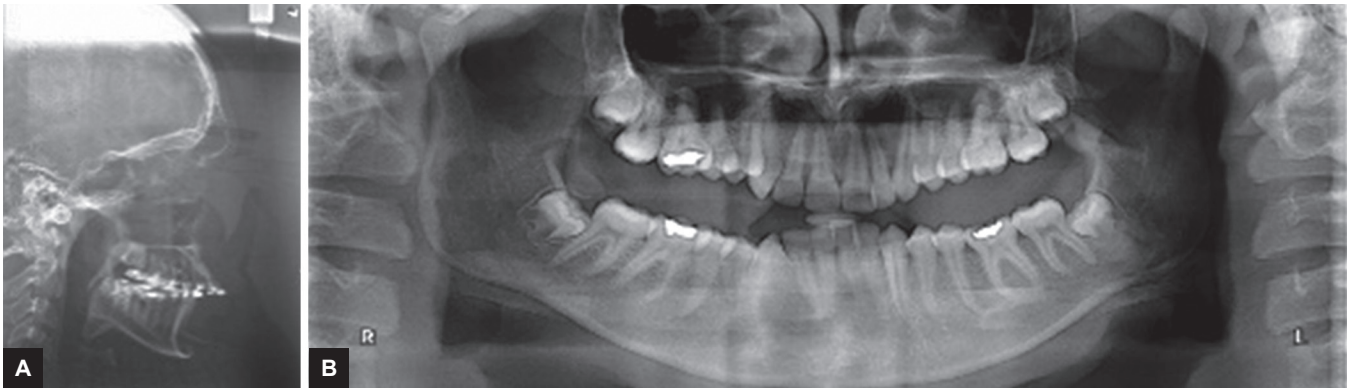
Angle class II div 2 malocclusion on a class II skeletal base between orthognathic maxilla and retrognathic mandible with horizontal growth pattern and decreased lower

anterior facial height, with overjet of 1 mm and overbite of 10 mm and lower anterior crowding was found.

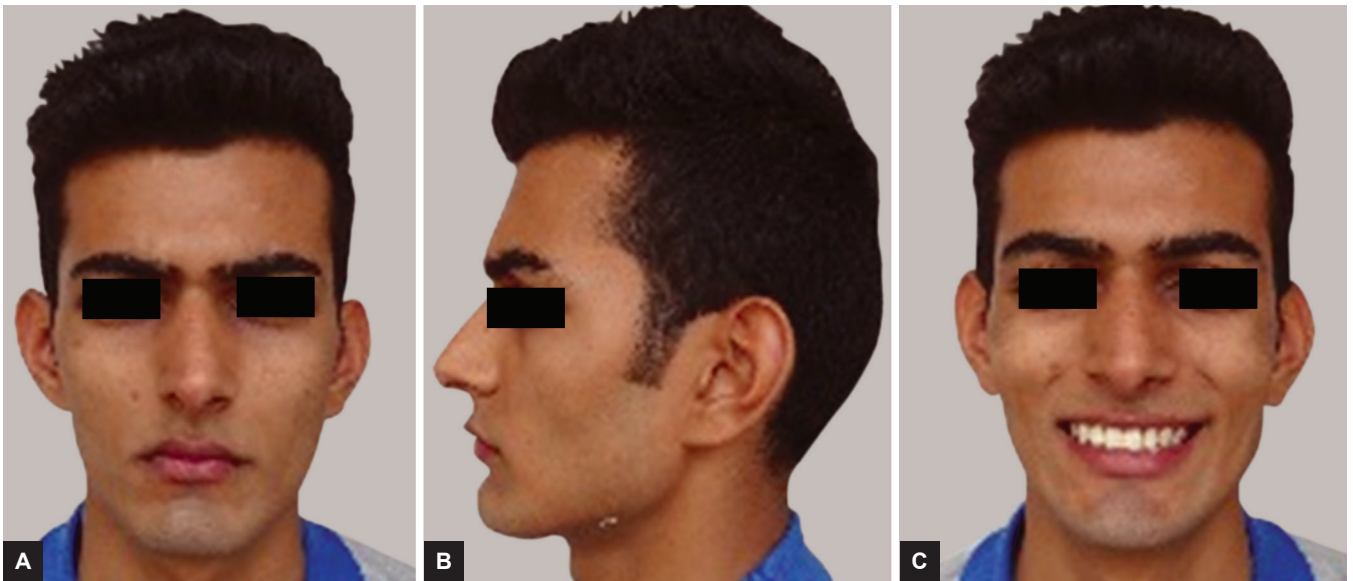
### Treatment Objectives

The treatment objectives were to obtain class I skeletal base, to level and align the teeth, to obtain the ideal overjet and overbite, to correct class II molar and canine relation,





Figs 4A and B: Presurgical lateral cephalogram and orthopantomogram



Figs 5A to C: Posttreatment extraoral view

and to improve soft-tissue profile. This patient had very thin cortical plate with lower prominent roots, so surgical plan was considered.

### Treatment Plan

- *Phase I:* Presurgical orthodontics, extraction of lower lingually placed incisor.
- *Phase II:* Orthognathic surgery, anterior repositioning of mandible.
- *Phase III:* Postsurgical stabilization.

### Treatment Progress

The case was started with preadjusted edgewise appliance using 0.022 slot McLaughlin, Bennett, Terevisi prescription. Lower incisor was extracted as planned for presurgical orthodontics. The 0.016 initial nickel-titanium (NiTi) archwires were placed for alignment followed by 0.016 × 0.022 NiTi and 0.017 × 0.025 NiTi wires. Intrusion of upper incisor was done on intrusion arches. The 0.021 × 0.025 stainless steel wires were placed for 2 months

to achieve proper torque. Anterior advancement of 7 mm was done with mandible surgically. The patient was put on settling elastics postsurgically.

### TREATMENT RESULTS

The total treatment duration was 17 months, with 11 months of presurgical orthodontics and 6 months of postsurgical management. Outcome of the treatment was a significant improvement in the patient's smile and profile (Figs 5A to C). Class I molar and canine relation was achieved, and ideal overjet and overbite established. Proper root paralleling and torque have been established. Upper and lower arches were well aligned (Figs 6 to 8).

### DISCUSSION

There are certain limitations to how far a tooth can be moved and these become important when the problem is of severe skeletal deformity.<sup>5</sup> The essential steps in presurgical orthodontics are to align the arches and make them



Figs 6A to C: Posttreatment intraoral view



Fig. 7: Postsurgical lateral cephalogram



Figs 8A and B: Posttreatment occlusal view without retainers

compatible to establish the anteroposterior and vertical position of the incisors. The extraction of lingually placed lower incisor aided the correction of the upper incisor position and alignment, and leveling the Curve of Spee in the lower arch.

Intrusion of upper incisors was done to correct deep bite. In patients whose mandible is normal in size, the retrognathic appearance results from downward and backward rotation of the chin due to locking by upper incisor. Anterior repositioning of the mandible allows the simultaneous increase in facial height and provides more chin prominence.<sup>6,7</sup> The clinical and cephalometric values showed that there is mild mandibular deficiency. The results satisfied the primary complaint of the patient. Once satisfactory range of motion and stability were achieved, the finishing stage of orthodontics was done with settling elastics. The presurgical and postsurgical cephalometric values showed a dramatic skeletal and dental improvement. The process starts with the initial diagnosis, followed by a treatment plan, and then patient consent. Treatment generally begins with a dental assessment to correct decay, followed by orthodontic decompensation in preparation for surgical intervention.<sup>8</sup> Orthognathic surgery is followed by postoperative orthodontia to maximize the occlusal relationship.

## 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.

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