

# Two-Phase Management of Class II Malocclusion: A Case Report

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**Abstract:** Myofunctional appliance therapy is one of the highly effective modalities of management of class II malocclusion in patients with remaining growth potential. Age, compliance, wear time, and skeletal maturation contribute to a successful outcome. A twin block appliance is beneficial when there is a positive visual treatment objective and a retruded mandible. In this case report, a 13-year-old male patient with a typical class II skeletal pattern was treated with a Twin block appliance followed by fixed orthodontic treatment. Significant soft tissue, dental, and skeletal changes can be achieved with proper case selection and patient compliance.

**Keywords:** Class II, Myofunctional Appliance, Skeletal Maturation, Twin Block.

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## I. INTRODUCTION

Class II malocclusion is commonly seen in day-to-day orthodontic practice. This results in esthetic, functional, and psychological effects of varying intensity on the patients [1]. The severity is dependent upon the extent of sagittal discrepancy and the related soft tissue structures. Among the different class II correction appliances, the Twin block has been the most commonly used and has been the subject of numerous trials and systematic reviews [2]. The twin block has upper and lower bite blocks with occlusal inclined planes that interlock at a 70-degree angle and guide the mandible forward and downward [3]. Better ease of use with a less bulky build has proven to be the reason for higher compliance in young adolescents. To encourage good compliance, patients are regularly scheduled for dental visits every 6-8 weeks [4].

## II. CASE REPORT

A 13-year-old male patient, with his parents, came to the department with a chief complaint of forwardly placed upper front teeth. On extraoral examination, the patient had a convex profile, brachycephalic pattern, incompetent lips with an interlabial gap of 4mm, acute nasolabial angle, receded chin position, and horizontal growth pattern. The intraoral examination revealed bilateral end-on relation for canines, class II molar relation, an accentuated curve of Spee, overjet of 8mm, and overbite of 6mm. (Fig. 1)



Fig 1 Extraoral and Intraoral Photo Records before Treatment

The patient's orthopantomogram showed a complete set of permanent teeth erupted with developing 18, 28, 38, and 48, and no other pathology was detected. The cephalometric analysis confirmed the diagnosis of skeletal class II base (Point A-Nasion-Point B angle, i.e., ANB, +5.5 degrees) with proclined and protrusive incisors. (Fig. 2) The diagnosis was

class II Division 1 malocclusion with a class II skeletal base and hypodivergent growth pattern. The cervical vertebrae radiograph indicated that he was past the peak of pubertal growth spurt, with considerable growth remaining. In addition, this patient showed a positive visual treatment objective.

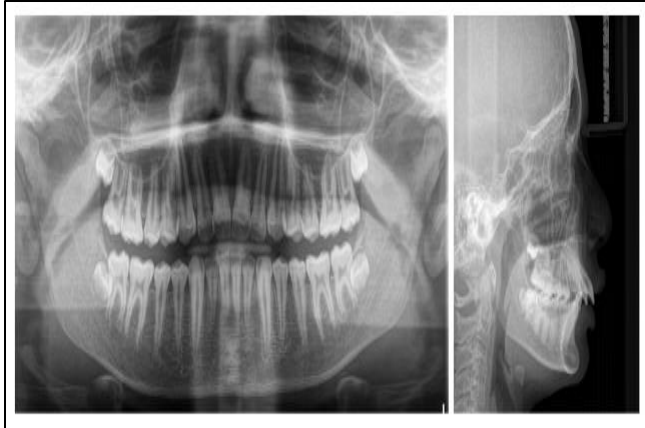


Fig 2 Pre-Treatment Orthopantomogram and Lateral Cephalogram X-rays

#### ➤ Treatment Objectives

- Correction of soft-tissue profile
- Correction of skeletal class II pattern
- Correction of increased overjet and overbite
- Correction of Class II molar relation
- Correction of the inclination and position of incisors

As the patient was in a growing phase (cervical vertebrae maturation stage 3), growth modification was planned with a myofunctional appliance; a Twin block (Phase I) followed by the fixed orthodontic appliance (Phase II).

Patient and parent counseling and consent were done. A wax bite registration was made with the mandibular arch guided forwardly, and a Twin block was fabricated. The patient was instructed regarding the usage with wear time. The wear time was 22 hours daily, and a recall visit was done every 6 weeks. (Fig. 3)



Fig 3 Insertion of Twin Block Appliance

After 7 months of the active phase, an improvement was observed in the profile and lip competency. A substantial correction in molar and canine relation was obtained with a reduction of overjet and overbite. (Fig. 4,5)



Fig 4 Extraoral and Intraoral Photo Records after Twin Block Therapy



Fig 5 Post-Treatment Orthopantomogram and Lateral Cephalogram X-rays after Twin Block Therapy

The pre-treatment and post-treatment cephalometric analyses after Twin block therapy have been compared. (Table. 1) The treatment objectives were achieved as depicted in the cephalometric analysis. An anterior inclined plane was fabricated for the support phase of Phase I myofunctional therapy. The lower twin block was removed to allow for posterior eruption. Phase II treatment included fixed orthodontic appliance therapy using short class II elastics (3.5 oz.). (Fig. 6)



Fig 6 Extraoral and Intraoral Photo Records at Phase II Fixed Orthodontic Appliance Therapy

### III. DISCUSSION

Class II malocclusion comprises a diverse combination of skeletal, dental, and soft tissue features, with findings showing maxillary excess, mandibular deficiency, or a combination of both. Twin block appliance therapy is advocated for growth modulation as myofunctional orthopedics is a widely accepted treatment modality when sufficient favorable growth remains [5]. This myofunctional appliance harnesses the adjacent neuromuscular forces so that orthopedic and orthodontic changes cause mandibular displacement [6].

Several studies have demonstrated the efficacy of the twin block appliance in inducing considerable skeletal and

dentoalveolar changes, thereby resolving class II malocclusion. In this case report, the skeletal changes should change in ANB angle from 5.5° to 2.5° with an improvement of the mandibular plane angle from 29° to 32°. The dental findings showed the proclination of upper incisors, whereas the lower incisors were proclined. The proclination of mandibular incisors was controlled by the application of labial root torque in the mandibular anterior teeth and the use of short class II elastics. A harmonious soft tissue profile was achieved after twin block therapy. The superimposition of the lateral cephalometric radiographs showed that the patient's growth was in a favorable direction. The findings were consistent with the previous literature[7,8].

Table 1 Comparison of pre- and post-treatment cephalometric parameters

S. No.	Cephalometric Parameters	Mean	Pre-Treatment value	Post-Treatment Values
<b>Skeletal Findings</b>				
1	Sella -Nasion- Point A; SNA (°)	82	79	78
2	Sella -Nasion- Point B; SNB (°)	80	74	75.5
3	ANB (°)	2	5.5	2.5
4	Occlusal plane to Sella-Nasion plane (°)	14	20	19
5	Mandibular plane angle (°)	32	29	32
6	Facial Mandibular Plane Angle; FMPA (°)	25	21	23
<b>Dental Findings</b>				
1	Upper incisor to Nasion-point A; U1 to N-A (mm)	4	9	9
2	Upper incisor to Nasion-point A; U1 to N-A (°)	22	36	31
3	Lower incisor to Nasion-point B; L1 to N-B (mm)	4	5	8
4	Lower incisor to Nasion-point B; L1 to N-B (°)	25	28	43
5	Upper incisor to lower incisor; U1 to L1 (°)	131	110	105
6	Incisor mandibular plane angle; IMPA (°)	90	104	110
<b>Soft Tissue Findings</b>				
1	Steiner 'S' LINE to Upper lip (mm)	0	3	2
2	Steiner 'S' LINE to Lower lip (mm)	0	2	4

### IV. CONCLUSION

The effect of twin block appliance therapy is influenced by the patient's compliance and proper case selection. Marked dentoalveolar changes were achieved in the short term, but the long-term effects are still questionable.

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