

# Orthodontic Management of Class II Division 2 Malocclusion with Single Mandibular Incisor Extraction: A Case Report

## Abstract:

Extraction of teeth in orthodontics has always been a matter of controversy. In recent years, extraction of a single mandibular incisor has gained acceptance as a reliable treatment option due to its simple mechanics and long-term advantages in managing lower anterior crowding. Preservation of facial balance and minimal impact on smile esthetics further support this approach. This article presents a case report of a 13-year-old male orthodontic patient with Class II Division 2 malocclusion & lower anterior crowding, successfully treated with single mandibular incisor extraction, achieving stable, functional, and esthetic results.

**Key-words:** Lower incisor extraction, Orthodontic treatment, Crowding, Tooth size discrepancy.

## Introduction:

Extraction therapy plays a vital role in orthodontic treatment to create space, improve facial balance, and achieve occlusal harmony. While premolar extractions are conventionally preferred, single mandibular incisor extraction remains a debated option due to concerns such as increased overjet or overbite, space reopening, and compromised esthetics. However, in carefully selected cases, it serves as a conservative alternative for resolving lower anterior crowding. When executed with proper mechanics and case selection, it ensures stable, functional, and esthetic treatment outcomes.[1,4]

Successful outcomes depend on accurate diagnosis and proper case selection. According to Owen[5] and others, Ideal candidates for single mandibular incisor extraction present with Class I molar relation, moderate lower anterior crowding, minimal overjet and overbite, and a balanced soft-tissue profile. Diagnostic tools such as arch length analysis, Bolton's discrepancy, and incisor inclination are essential for treatment planning. This case highlights the effectiveness of lower incisor extraction in managing mandibular crowding with stable and esthetic results.

## Case Report:

A 13-year-old male patient reported to the Department of Orthodontics with the chief complaint of irregularly placed upper and lower front teeth. No relevant medical history was present. No history of trauma.

**<sup>1</sup>SANJEEV KUMAR VERMA, <sup>2</sup>ANSARI MUNAZZA SHAMIEM, <sup>3</sup>HUMA AZAD, <sup>4</sup>PRAMOD KUMAR YADAV**

<sup>1,2</sup>Department of Orthodontics & Dentofacial Orthopaedics, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh

<sup>3</sup>Private practitioner, Aligarh,

<sup>4</sup>Dept of Periodontia & Community Dentistry

Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh

## Address for Correspondence:

Dr. Ansari Munazza Shamiem

Junior Resident


Department of Orthodontics and Dentofacial Orthopaedics,

Dr. Z. A. Dental College, Aligarh Muslim University,

Aligarh, U.P.

Email:ansarimunazza777@gmail.com

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**Clinical Findings:**

Extraoral examination revealed apparently symmetrical, mesoprosopic face with convex profile and competent lips. There were no signs of temporomandibular joint dysfunction and abnormal mandibular movement. Smile analysis showed Morley's ratio of 100% and average buccal corridors. Intraoral examination showed end on molar relation bilaterally & end on canine relation bilaterally, with Class II Division 2 Type B incisor relation, lingually blocked out 32 & 42, rotated 12 & 22 with reduced overjet. Lower dental midline was shifted towards right side by 1 millimeters. There was 70% deepbite and Curve of Spee of 1 mm. Pit and fissure caries w.r.t. 16, 26, 36, 46, 17 and 47(Figure 1). The arch length tooth material discrepancy in maxillary arch is 4 mm and in mandibular arch is 4 mm.

Radiographic findings - Orthopantomogram showed third molar buds in all four quadrants and no anatomical and pathological abnormalities (Figure 2). Lateral Cephalometric analysis showed Skeletal Class II base due to retropositioned mandible, hyperdivergent growth pattern and CVMI stage – 3 (Table 1)

**Treatment objective/Goals:**

To restore the pit and fissure caries, to relieve crowding and alignment and levelling of both the arch. To achieve optimum overjet, overbite and Class I molar relation and Class I canine relation bilaterally. To achieve optimum soft tissue balance, followed by long term retention in both the arch.

**Treatment Plan ;**

Extraction with respect to 42 followed by Fixed Orthodontic Mechanotherapy With Preadjusted Edgewise (MBT-022 X 028" Slot) Appliance. Long term retention in both maxillary and mandibular arch.

**Treatment progress;**

Treatment was initiated with the restoration of dental caries, followed by bonding using a 0.022" × 0.028" pre-adjusted edgewise (MBT) appliance. Alignment and levelling of the upper arch were carried out sequentially with 0.012", 0.014", 0.016", and 0.016" × 0.022" NiTi archwires (Figure 3). The lower arch was similarly aligned with 0.012" to 0.016" × 0.022" NiTi wires. Space for tooth 32 was created using an open-coil spring, after which 32 was engaged with a light continuous archwire (Figure 4). Extraction of tooth 42 was performed, and wire progression continued up to 0.019" × 0.025" stainless steel in both arches (Figure 5). Bracket repositioning was done, followed by final finishing and detailing with 0.014" stainless steel wires. Upon completion,

fixed palatal and lingual retainers were placed in both arches to prevent relapse, and post-treatment records with cephalometric analysis were obtained (Figure 6,7)(Table – 2).

**Treatment Result:**

Post-treatment photographs showed an acceptable facial profile. Intraorally Angle Class I molar relationship and Class I canine relationship achieved and proper overjet and overbite were achieved, with good interdигitation. The smile appearance of the patient improved. OPG showed no significant root resorption or alveolar bone loss.

Table 1. Pre-Treatment Cephalometric Readings

Sagittal Skeletal Components			
		Pre-Treatment	Inference
SNA		83°	Class II
SNB		75°	
ANB (3.12±1.8°)		8°	
Wits (female = 0 ; male = -1)		6.6 mm	
Vertical Skeletal Components			
FMA ( 23.83±2°)		31 °	Hyperdivergent
SN-MP (32-35°)		40 °	
Dental Components			
Mx 1 to NA: 4.92±2.05mm		-3.3 mm	Retruded
Mx 1 to NA: 24.02±5.82°		5 °	Retroclined
Md 1 to NB (6±1.7mm)		4.4 mm	Normal
Md 1 to NB (27±4.3 °)		26 °	Normal
IMPA (94°)		91 °	Retroclined
Soft tissue findings			
		Pre-Treatment	Inference
E – line (mm)	Upper lip (-4mm)	2.2 mm	Protruded
	Lower lip (-2 mm)	0 mm	Protruded
Nasolabial angle		96°	Decreased

Table 2. Pre-Treatment & Post-Treatment Reading Comparison

Sagittal Skeletal Components		
	Pre-Treatment	Post-Treatment
SNA	83°	85°
SNB	75°	79°
ANB (3.12±1.8°)	8°	6°
Wits (female = 0 ; male =-1)	6.6 mm	2.2 mm
Vertical Skeletal Components		
FMA ( 23.83±2°)	31 °	33°
SN-MP (32-35°)	40 °	40°
Dental Components		
Mx 1 to NA: 4.92±2.05mm	-3.3 mm	2.2 mm
Mx 1 to NA: 24.02±5.82°	5 °	20°
Md 1 to NB (6±1.7mm)	4.4 mm	6.6 mm
Md 1 to NB (27±4.3 °)	26 °	29°
IMPA (94°)	91 °	90°

Soft tissue findings			
		Pre-Treatment	Post-Treatment
E - line (mm)	Upper lip (-4mm)	2.2 mm	1.1 mm
	Lower lip (-2 mm)	0 mm	3.3 mm
Nasolabial angle		96°	88°



Figure 1. Extraoral and Intraoral Pretreatment Photograph

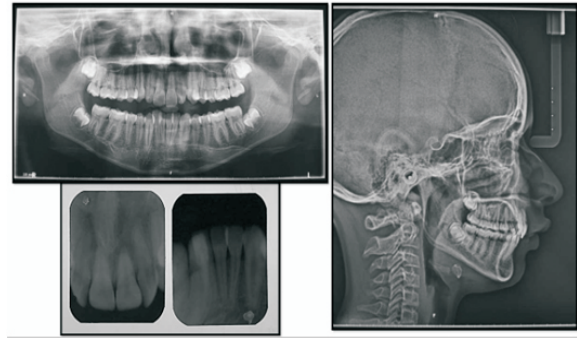


Figure 2. Pretreatment X-rays



Figure 3. Bonding of upper and lower arch and initial wire placement in upper arch



Figure 4. Space creation and engagement of 32 in continuous arch wire

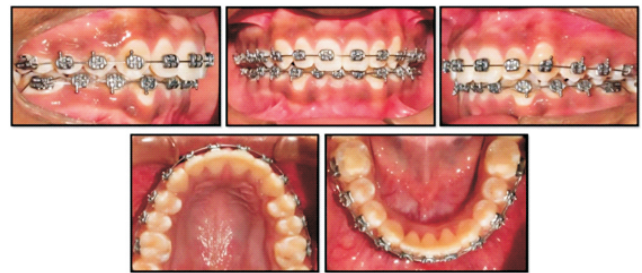


Figure 5. Extraction with respect to 42



Figure 6. Post Treatment Photographs

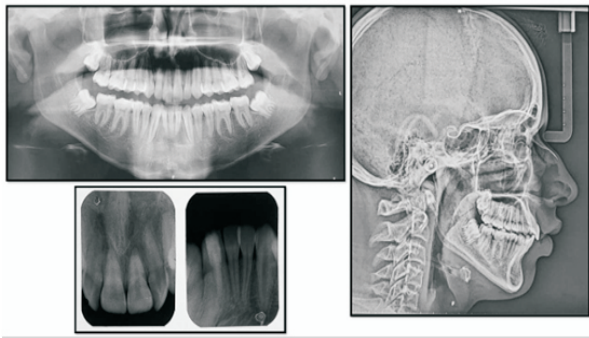


Figure 7. Post Treatment X Rays

### Discussion:

Successful outcomes following mandibular single-incisor extraction have been reported by Beycan (2016)[6], Vilhjálmsón (2019)[7], and Gandhi et al. (2023)[8]. However, studies by Riedel[9] suggested treatment with lower incisor extraction in certain malocclusions only. When carefully selected, single incisor extraction provides excellent esthetic and functional results with simple mechanics and often greater post-treatment stability than premolar extraction[10]. It maintains a harmonious facial profile by preserving lower incisor position, shortens treatment time, and relieves anterior crowding while maintaining good posterior interdigitation without altering intercanine width[11].

In the present case, extraction of a single mandibular incisor effectively relieved the lower anterior crowding and the occlusal relationships achieved were stable and harmonious, with Class I molar and canine relationships bilaterally. The patient exhibited improved dental alignment and facial balance without any adverse change in soft-tissue profile. Lengthy retention to allow for periodontal adaptation is better for the post-retention stability; hence fixed bonded retainers were given in both the arches in this case.

### Conclusion:

Careful case selection and sound clinical judgment are essential for successful outcomes with mandibular incisor extraction. When properly indicated, it offers a simple and effective solution for lower anterior crowding. Controlled mechanics and precise torque management help maintain occlusal stability and esthetics. This approach preserves facial balance and minimizes unnecessary tooth movement. Overall, mandibular incisor extraction can provide stable, functional, and esthetically pleasing results in well-selected cases.

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