

Extraction treatment of Class II Div.2 case with missing lower lateral incisors

AUTHORS

Dr. Farozan Jabeen^{1*}, Prof. Sandhya Maheshwari², Dr. Mohammad Zubair Ansari³, Dr. Naaz Amrin⁴

^{1*}(Corresponding author- F/7, agriculture college staff colony, Rewa,486001)

² Professor, ^{3,4} Junior Residents, Z.A. Dental College, Aligarh Muslim University, Aligarh, India

Abstract

This case report presents the successful treatment of a Class II division 2 malocclusion with missing lower lateral incisors. The discrepancy in the maxillary and mandibular arches were resolved by extraction of the bilateral maxillary first premolars on both sides. Deep bite was corrected using an interior biteplate. Space gained by extraction was utilised for retraction of protruded upper anteriors. Multiple loop archwire was used for intrusion of upper central incisors, then active laceback of maxillary canines was done followed by retraction of maxillary incisors using 19x25 TMA t-loop. A nance palatal arch was incorporated to reinforce the anchorage. Posttreatment changes were favourable with respect to deep bite, inclination of upper incisors and lower incisors as well as the stomatognathic function of patient.

Key Words: class II Div 2; extraction treatment;

Date of Submission: 26-02-2021

Date of Acceptance: 11-03-2021

Ast and coworkers¹ found that the incidence of Class II Division 2 to be 3.4% and for Class II Division 2 subdivision to be 1.6%^{1,2}. In case of Class II division 2 malocclusions, chances of relapse is high and these type of cases are reportedly difficult to treat³. Dilemma faced while treating these type of cases is whether to follow extraction or non extraction regimen. Mainly decision is taken depending upon the age of patient, arch length tooth material discrepancy, overjet and overbite after correcting the position of anteriors, lip relation to incisors and finally stability of results achieved.

In cases of Class II division 2 malocclusion, usually nonextraction treatment is preferred because extraction treatment might exacerbate the deep bite⁴⁻⁶

In such cases arch length tooth material discrepancy is resolved by proclining incisors, lateral expansion of dentition and sometimes distalization of molars.

However, these methods have their own limitations depending upon patients age, patient's maxillofacial morphology and stability⁷. Dentition space analysis is valuable for orthodontic diagnosis and design. Arch length discrepancy is sometimes used as a rationale for tooth extraction in orthodontic treatment. In cases of Bolton's discrepancy in anteriors due to missing lower incisors, it becomes inevitable to undergo extraction therapy.

I. CASE REPORT

A 21 years old female reported to the department of orthodontics and dentofacial orthopedics with chief complaint of irregularly placed upper front teeth. She presented the history of extraction of two lower incisors.

Extraoral examination,

Patient exhibited Euryprosopic face, a pleasant convex Profile and competent lips. Faciomaxillary concordance was observed on smiling. Smile analysis showed 100% Morley's ratio, average smile index and smile line, nonconsonant smile arc and average buccal corridors.

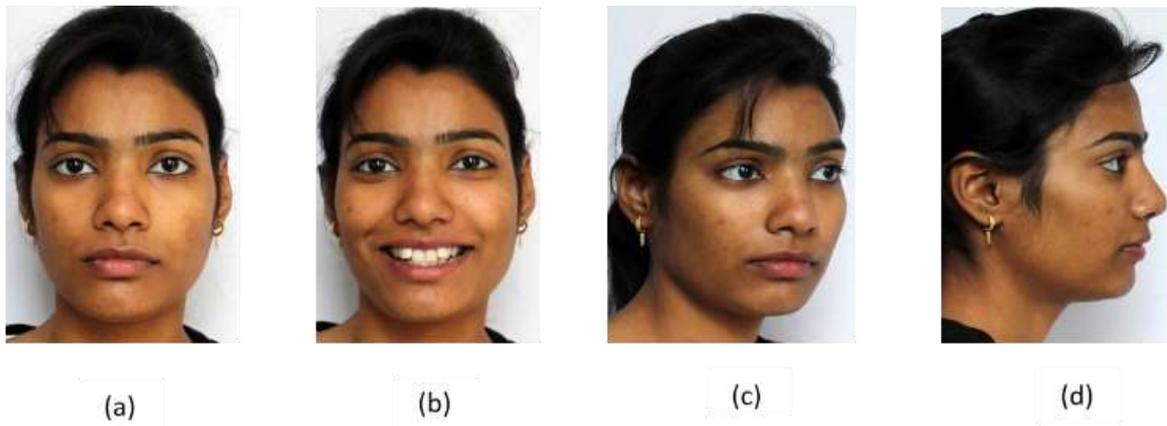


Figure 1: Extraoral photographs of the patient (a) frontal (b) frontal smiling (c) oblique (d) right profile

Intra-oral examination:

Upper and lower midline are discordant with lower midline shifted towards left by 2 mm (fig. 2 a), Class I molar and canine relationship on left side (fig. 2 b), Class II molar relationship on right side and End on canine relationship on right side (fig. 2c). Incisal relation was class II Div.2 with Overbite of 80% and Overjet of 1 mm (fig. 2 a).

Both the maxillary and mandibular arches were of the square type, with 8.0-mm maxillary and 1.5-mm mandibular arch length discrepancies (fig.3 a &b).

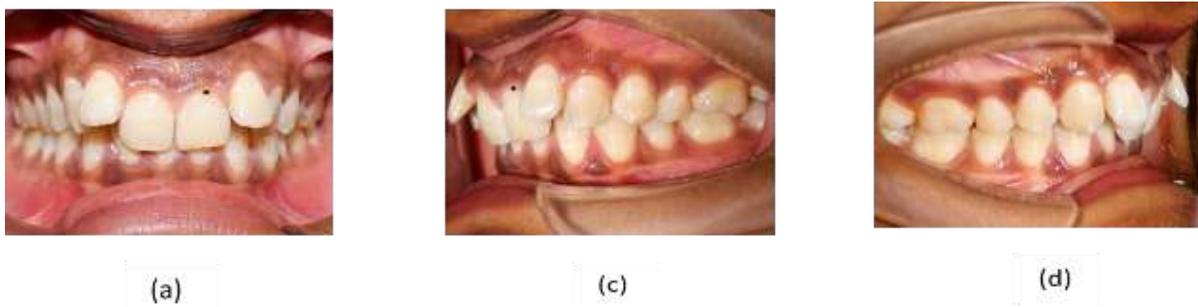


Figure 2: Intraoral photographs of the patient (a) frontal (b) left (c) right



Figure 3: Occlusal photographs of the patient (a) maxillary (b) mandibular

Cephalometric findings

The lateral cephalometric analysis indicated a skeletal Class II jaw base relationship with an ANB angle of 3 and an average mandibular plane angle (FMA 23 deg.), retruded and retroclined upper incisors (Max. 1 to A-pog 2mm, Max. 1 to NA 6 deg.). lower incisors were found to be retroclined (IMPA of 98 deg.) and CVMI stage V (table 1).

Table 1: Composite cephalometric analysis Variables	Norms	Pre-treatment
Post-treatment		
SNA	82°	81°
		80°

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SNB	80°	78°	77°
ANB	3.12°±1.8°	3°	3°
N ⊥ to A point	-4.46mm	-2.5	-2
N ⊥ to B point	-11.03mm	-10.5	-10
N ⊥ to Pog	-10.5 mm	-10.5	-10
Max-mand difference:	28 mm	24.5	24.5
FMA	23.83±2°	23°	24°

DENTOALVEOLAR FINDINGS

Mx 1 to NA:	4.92±2.05mm	-2mm	+3mm
Mx 1 to NA:	24.02±5.82°	6°	20°
Mx 1 to Palatal Plane	71 °	85°	75°
	6.74±1.3mm	2mm	5mm
Mx 1 to A-Pg	-2 to 2mm	-3mm	+1mm
Md 1 to A-Pg			
Md 1 to NB	6±1.7mm	+1.5mm	+5.5mm
Md 1 to NB	27±4.3°	23°	31°
IMPA	90°	98°	104°
Inter-incisor Angle	123°	146°	125°

Soft tissue findings

E – line (mm)	Upper lip (-4mm)	-2mm	-2mm
	Lower lip (-2 mm)	0mm	0mm
S – line (mm)	Upper lip(0 mm)	+1mm	+1mm
	Lower lip(0 mm)	+1.5mm	+2mm
Nasolabial angle		110	112
Inter labial gap	0mm	0mm	0mm
Lip strain	0 mm	1mm	0mm

Diagnosis and Treatment Objectives

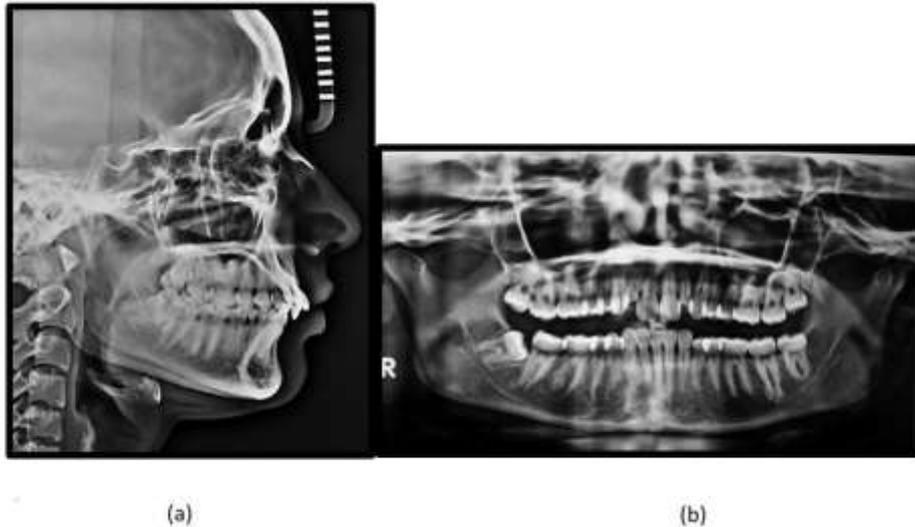


Figure 4: Pretreatment radiographs of the patient (a) lateral cephalogram (b) Orthopantomogram

Patient was diagnosed as a 21 years old female with chief complaint of irregularly placed upper front teeth, Angle's Class I molar and canine relation (left) Class II molar relation(right), End on canine relation(right) & Incisal relation- class II Div.2 on skeletal class II base with Normodivergent growth pattern & CVMI V. The main treatment objectives were to Level the maxillary and mandibular arches, Correction of overjet and overbite, to achieve class II molar and canine relationship bilaterally. Achieving optimum soft tissue balance and long term retention.

The discrepancies in the arches would be resolved by extraction of the maxillary first premolars on both sides with maximum anchorage on maxillary molars.

Treatment Progress

1. Banding and bonding was done in upper arch
2. Placement of anterior bite plate for deep bite correction
3. Alignment and levelling using fixed orthodontic mechanotherapy with preadjusted edgewise (MBT-022X028" slot) appliance and placement of multiple loop for alignment and intrusion of maxillary incisors.
4. Bracket repositioning and placement of continuous wire in maxillary arch
5. Banding and bonding in lower arch
6. Progression from round NiTi to rectangular SS wire in both arches
7. Extraction of 14, 24 was done
8. Canine retraction using active laceback (fig.5)
9. 19x25 TMA T-loop for retraction of incisors (fig.6)
10. Finishing and detailing



Figure 5: Active laceback of maxillary canines



Figure 6: retraction of maxillary incisors using 19x25 TMA T-loop

OBJECTIVES ACHIEVED

1. Corrected deep bite of 80% to overbite of 25%
2. Improved max. incisor position (Max 1 to A-Pog 2 mm to 5mm, Max 1 to NA -2 mm to +3mm).
3. Improved max. Incisor inclination (Max 1 to NA 6 deg. To 20 deg.)
4. Improved md. incisor position (Md 1 to A-Pog -3 mm to +1mm, Md 1 to NB +1.5 mm to +5.5mm).
5. Improved mandibular Incisor inclination (Max 1 to NB 31 deg. To 25 deg., IMPA 98 to 104 deg.)

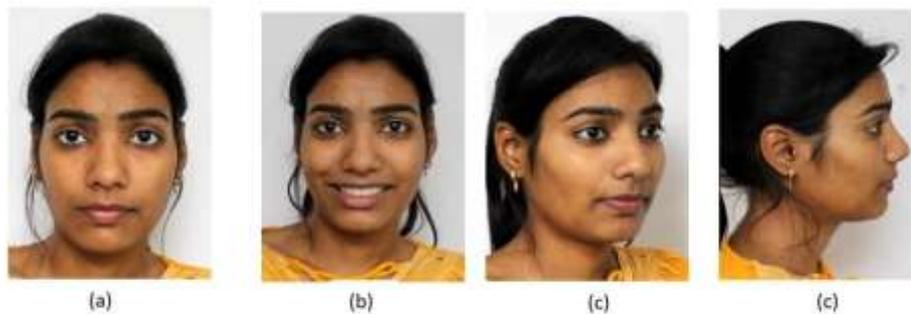


Figure 7: Extraoral photographs of the patient (a) frontal (b) frontal smiling (c) oblique (d) right profile

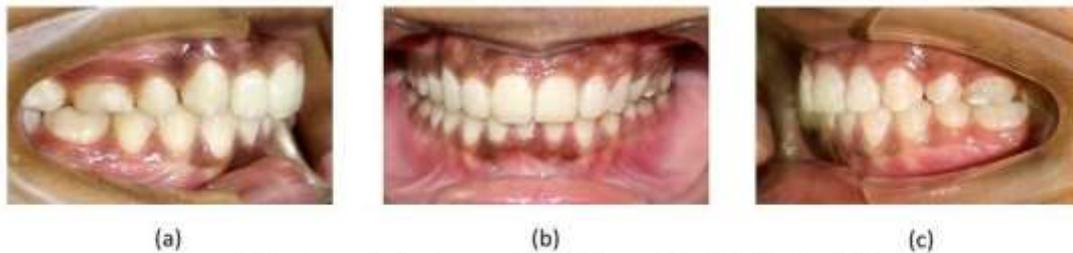


Figure 8: Intraoral photographs of the patient (a) frontal (b) frontal smiling (c) right profile



Figure 9: Intraoral photographs of the patient (a) maxillary (b) mandibular

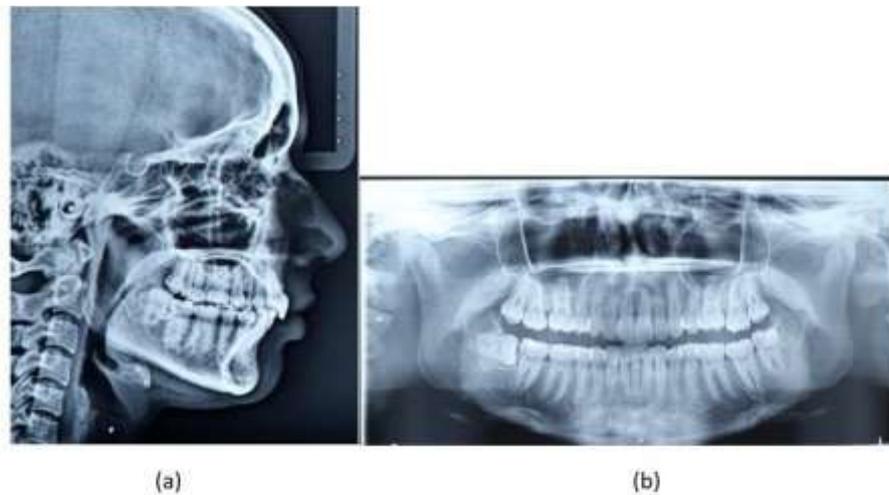


Figure 10: Posttreatment radiographs of the patient (a) lateral cephalogram (b)

II. Discussion

When discrepancy in anterior region was found due to missing lower incisors, we first considered intrusion of upper central incisors to prevent excessive proclination. After alignment of maxillary incisors, an excessive overjet was created due to boltions discrepancy in anteriors as well as profile of the patient got worsened. Since patient was a nongrowing adult with average buccal corridors as well as erupted third molars in maxillary arch, distalisation of molars and arch expansion were opted out. After reaching 19x25 SS archwire, extraction of maxillary first premolars was done and active laceback of maxillary canine was started. To reinforce the anchorage in posteriors, a nance palatal arch was incorporated. After canines were settled in position, retraction of incisors was done using 19x25 TMA t-loop. Occlusion was settled in class II from previous end-on relation on right side, to maintain optimal soft tissue balance. Post treatment analysis revealed an improved dentoalveolar relationship (max. 1 to NA was improved from -2mm to +3mm). overbite improved from 80% to 25%.

III. Conclusion

Extraction therapy in cases of adults is sometimes an effective approach for orthodontic camouflage especially in cases where other method of space gaining such as expansion and molar distalisation are impractical.

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How to cite this article: Dr. Farozan Jabeen. "Extraction treatment of Class II Div.2 case with missing lower lateral incisors." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(03), 2021, pp. 55-60.