

Case Report

Severe class II div 2 malocclusion with impacted canines- A case report

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ABSTRACT

Non surgical correction of severe deep bite malocclusion always poses a challenge, especially when it is associated with a Class II skeletal base. Here a case with severe Class II div 2 malocclusion (>200% deep bite) with impacted canines is presented which was successfully treated non-surgically. Class II div 2 malocclusion, impacted canines, skeletal deep bite, gummy smile

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1. Introduction

Class II div 2 malocclusions commonly present with deep bite and retroclined incisors, with varying severity in each individual.¹ The degree of deep bite, facial type, presence of scissor's bite or cross bite, impacted teeth adds to the complexity of the malocclusion. Here we present successful non surgical treatment of a severe skeletal deep bite with Class II div 2 malocclusion, complicated due to >200% deep bite, impacted all 4 canines and all premolars in scissor's bite.

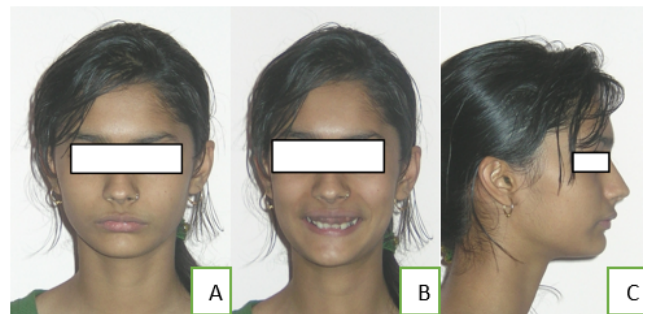


Fig. 1: (a-c) Pre treatment extraoral photographs

Table 1: Pre treatment cephalometric analyses

	Norm	Pre
SNA	82	83
SNB	80	76
ANB	2	7
SN-MP	32	23
U1-NA	22/4	-14/-10mm
L1-NB	25/4	4.5/-3mm
IIA	135	182
IMPA	90	81



Fig. 2: (a-e) Pre treatment intraoral photographs

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Fig. 3: Pre treatment lateral cephalogram



Fig. 6: Post treatment orthopantomogram



Fig. 4: Pre treatment orthopantomogram



Fig. 7: Post treatment lateral cephalogram



Fig. 5: Progress lateral cephalogram



Fig. 8: (a-e) Post treatment intraoral photographs

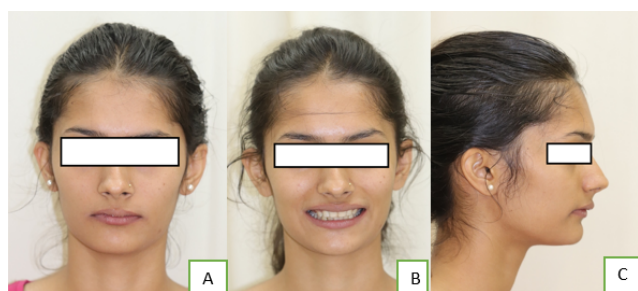


Fig. 9: (a-c) Post treatment extraoral photographs

Table 2: Post Treatment cephalometric analyses

	Pre Treatment	Post Treatment	Change
SNA	83	81	-2
SNB	76	74	-2
ANB	7	7	0
SN-MP	23	27	+4
U1-NA	-14/-10mm	13/1mm	+27/+11
LI-NB	4.5/-3mm	33/6mm	+28.5/+9
IIA	182	127	-55
IMPA	81	108	+27

2. Diagnosis

A 16-year old female patient presented with chief complaint of unesthetic smile. Extra oral examination revealed, Lips were competent and everted suggestive of over closure, and smile was gummy and unesthetic. Face was symmetric with brachyfacial face type. (Figure 1) Intra oral clinical examination revealed presence of all permanent teeth except the 4 canines. Retroclined upper and lower incisors with more than 200 percent deep bite, all the premolars were in scissor's bite, full cusp class II molar relation on both sides. She had a good oral hygiene, however due to traumatic occlusion lower incisors displayed attrition and gingival recession (Figure 2). Radiographic examination revealed impacted all 4 canines (Figure 3), the upper canines were favourable^{2,3} and easily palpable buccally, while the lower canines were mesial and buccal to lower lateral incisors and deep in the vestibule close to the apical 1/3rd of lateral incisor roots' which was considered less favourable⁴. Cephalometric analysis (Table 1) revealed class 2 skeletal base with ANB of 7 degrees and horizontal growth pattern with retroclined and backwardly placed upper and lower anteriors with reduced lower anterior facial height (Figure 4).

2.1. Treatment objectives

1. Correction of deep bite
2. Alignment of impacted teeth
3. Correction of scissor's bite
4. Achieve normal overjet overbite

5. Increase in lower anterior facial height
6. Correction of gummy smile

2.2. Treatment options

1. Option 1: Orthodontic treatment to level and align the arches and bring impacted teeth in alignment followed by surgical advancement of mandible.
2. Option 2: Orthodontic treatment to level and align the arches and bring impacted teeth in alignment followed by fixed functional appliance.
3. Option 3: Orthodontic alignment of impacted teeth and convert div 2 to div 1 followed by extraction of upper first premolars to correct the overjet and overbite.

2.3. Treatment progress

The patient was not ready for surgical option, and as there was large amount of space requirement in the lower arch (15mm) for alignment of impacted canines and decrowding, any further proclination of lower incisors with fixed functional appliance was considered inappropriate. It was decided to treat the case with option 3.

The case was started with strapping the upper arch with 022 slot Roth Preadjusted edgewise appliance. The upper anteriors were flared to convert the div 2 pattern to div 1. Since it was a severe skeletal deep bite case, it was important to increase the vertical dimension before attempting any other tooth movement. A fixed anterior bite plate soldered to maxillary 1st molar bands, was placed to allow extrusion of posterior teeth for correction of the under developed alveolar processes.⁵ Upper archwire was removed, and lower arch was now strapped up. (Figure 5)

After initial alignment, nickel titanium open coil springs were placed to make space for the impacted lower canines, after nearly 8 months when the posteriors erupted and came in occlusion the soldered bite plate was removed and both upper 1st premolars were extracted to allow spontaneous eruption of upper impacted canines, in the lower arch after gaining adequate space flap surgery was performed and attachments with ss ligature chain were bonded on the canines and flap was sutured back. Distal, buccal and extrusive force was applied on canines thru molars and premolars.

After the eruption of upper canines they were bonded and individually retracted on 018 ss premium plus arch wire, this was followed by incisor retraction on 19x25 ss boot loop archwire, loop was activated multiple times to gain torque in the anteriors,⁶ and also one micro implant was placed in the upper arch between the central incisors to intrude and control torque⁷ during the incisor retraction, in the lower arch the lower canines erupted after about almost 15 months of flap surgery, after their emergence lower lateral incisors which were left undisturbed till now were also aligned.

Towards the end of incisor retraction when 2 mm space on either side was left, little anchor loss was noted, any further anchor loss would compromise the occlusal outcome so at that stage two micro implants in the upper posterior segment were placed and utilised to close the remaining space.

After space closure 0.016 ss Australian wire was utilized for final finishing and detailing. The case was debonded and lower canine to canine fixed retainer and upper essix retainer were placed.

2.4. Complications

This was a skeletal deep bite case with scissor's bite of all the premolars, there were lot of bond failures in the lower premolar region, which were immediately rebonded and later banded. There was recurrent lower lip laceration on the right side due to the open coil spring. It resolved within 2 weeks of removal of the spring, white spot lesions suggestive of decalcification were noted in all 1st molars this was due to prolonged treatment duration. The post treatment orthopantomogram suggested mild root resorption in lower lateral incisors (Figure 6)

3. Result

All the occlusal and esthetic issues were resolved, all impacted teeth were aligned, normal overjet, overbite with good torque of anterior teeth was achieved, scissors bite of premolars was corrected, class I canine and class II molar on both sides was achieved, gummy smile was resolved, and there was desirable increase in lower anterior facial height which was evident with increase in mandibular plane angle. Both upper and lower incisor were now normally inclined with good and stable inter incisal angle. (Table 2) (Figure 7). Total treatment duration was 48 months, which was expected considering the severity of the malocclusion (Figures 8 and 9)

4. Discussion

The muscle forces in skeletal deep bite cases are so high⁸ that all kind of tooth movement is highly restricted. Here the main role for successful treatment outcome was played

by the use of fixed anterior bite plate which allowed development of the under developed alveolar processes, thereby allowing successful movement of teeth in vertical and sagittal direction

This was a severe class II div 2 malocclusion (>200 percent deep bite), complicated with impacted canines. This case was successfully treated non surgically and over all a good result was achieved.

5. Source of Funding

None.

6. Conflict of Interest

None.

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