

Extraction vs Non-Extraction approach to Class II Division 2 Malocclusion Treatment : Report of Two Cases

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Abstract:

Increased awareness and concern regarding the appearance and facial esthetics has changed the trend towards treatment of overall facial profile rather than just considering the type of malocclusion. To extract or not to extract has been an important question for orthodontists in treatment planning. In patients with moderate to severe Angle's Class II division 2 malocclusions, the chief complaint is typically an increased vertical overlap of the incisors with crowding in upper and lower arches. Angle's Class II division 2 malocclusion patients are usually associated with mandibular retrognathism. This skeletal discrepancy can be either corrected by growth modification in growing patients or can be camouflaged by extractions in the upper arch. This case report presents two cases of Angle's Class II division 2 malocclusion, one treated by extractions in upper arch and the other by growth modification.

Keywords: Angle's Class II division 2, Twin Block, Pre-functional alignment.

Introduction

Today's generation has an increased awareness and concern regarding their appearance and facial esthetics. Effect of orthodontic treatment on facial form and facial harmony has become the prime concern for the orthodontic patients, their parents and practitioners. With this increased esthetic awareness, a trend towards treatment of overall facial profile rather than just considering the type of malocclusion has started.

In patients with moderate to severe Class II division 2 malocclusion, the chief complaint is typically an increased vertical overlap of the incisors and normal or decreased overjet along with crowding in upper and lower

arches.

The Class II division 2 malocclusion is a clinical entity, which presents considerable difficulty in the provision of a stable result.¹ The success of treatment lies in correction of the transverse, anterior-posterior and vertical discrepancies. Furthermore, the importance of correcting the inter-incisal angle and edge centroid relationship is paramount for stability.²

Treatment of an actively growing Class II division 2 patient with a moderate or severe skeletal discrepancy has involved proclining the upper labial segment, thereby, converting the incisal relationship to Class II division 1 malocclusion. This has, commonly, been achieved in pre-functional alignment phase

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using an upper removable appliance, for example, an Expansion and Labial Segment Alignment Appliance or by using fixed mechanotherapy in the upper arch. This is then followed by a phase of functional appliance treatment to correct any sagittal discrepancy.³

The Twin Block developed by Clark (1982), has proved a popular and clinically successful appliance. With improved patient co-operation and increased daily wear, correction of a sagittal discrepancy is possible in many patients within a 6–9 month period.⁴

Other potential treatment options include nonextraction molar distalization treatment, extraction of maxillary first premolars and mandibular second premolars, or extraction of only maxillary first premolars. Some patients may not be candidates for mandibular anterior repositioning appliances. For example, a dolichocephalic patient may show protrusive lower incisors, potential steepening of the occlusal plane and potential clockwise mandibular rotation resulting in an additional increase in facial height in an already long-face patient. The question which arises is whether extraction of maxillary first premolars can be performed without negatively affecting the facial profile in patients who are not candidates for nonextraction functional appliance therapy.⁵

Mihalik et al⁶ demonstrated that the occlusion obtained from premolar extractions for orthodontic camouflage in a Class II mandibular deficiency patient is stable. As a result, extraction of only maxillary premolars with the goal of finishing with Class II molars and Class I canines is a viable functional compromise.

Case Reports

This case report illustrates two patients having Angles Class II div 2 malocclusion treated with entirely different treatment modalities including extraction and non extraction approach. In one patient camouflage orthodontic treatment was done by extracting upper first premolars and in the other patient, myofunctional therapy was done using a twin block appliance.

Case 1

Pre Treatment Assessment: Patient of 14 yrs of age complained of irregular upper front teeth. Patient had no relevant medical history and on extra oral examination revealed convex profile, & incompetent lips. Intraoral examination revealed Class II molar & canine relation, good oral hygiene, healthy soft tissue, U shaped maxillary & mandibular arches and maxillary midline shift towards left with labially blocked upper left canine. Cephalometric examination revealed a moderate class II skeletal relation (ANB - 5°) with vertical growth pattern (FMA- 30°), normal maxillary incisor inclination and slightly increased mandibular incisor inclination.



Fig.1. Pre-treatment Extra Oral Photographs (Case -1)



Fig.2. Pre-treatment Intra Oral Photographs (Case -1)

Diagnosis: Angles Class II div 2 malocclusion.

Treatment Objectives: Alignment and levelling of the arches and camouflage the skeletal discrepancy and correcting the midlines and finish the occlusion with Class I canine and Class II molar relation.

Treatment plan: Treatment was planned using fixed pre-adjusted edgewise orthodontic appliance (022 MBT) along with extraction of upper first premolars and proximal stripping in lower anteriors for camouflaging the skeletal discrepancy and achieving a stable harmonious occlusion.



Fig.3. Post-treatment Extra Oral Photographs (Case -1)



Fig.4. Post-treatment Intra Oral Photographs (Case -1)

Post treatment assessment

- Class II molar & Class I canine relation
- Normal overjet & overbite
- Duration of the treatment was 15 months.

Table. 1. Cephalometric measurements (Case -1)

Values	Pre-Treatment	Post-Treatment
SNA	81.5°	82°
SNB	77°	77°
ANB	4.5°	5°
FMA	30°	32°
U1 to SN	103°	99°
IMPA	102°	98°
Inter-incisal Angle	120°	125°
Lower lip to E-plane	+2 mm	+2 mm

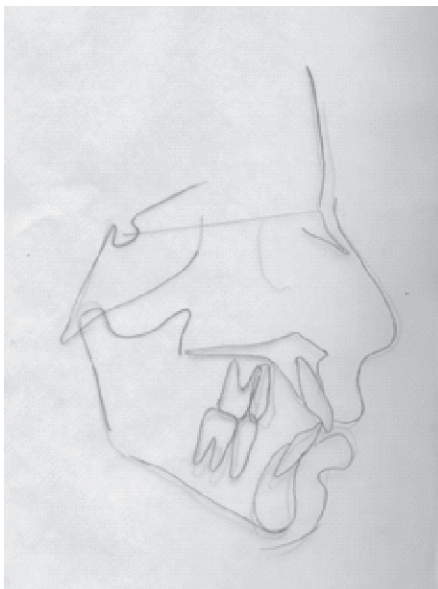


Fig.5. Superimposition of pre-treatment and post – treatment (Case -1)

Discussion:

The case was successfully managed by extractions of first premolars in the upper arch thereby camouflaging the skeletal discrepancy. Patient had the vertical growth pattern which would have worsened if anterior

positioning of the mandible had been done to correct skeletal discrepancy. Upper anterior teeth were aligned, levelled and retracted to achieve Class I canine relation and Class II molar relation, lower lip exhibited normal position in relation to E-plane. Patients had an improved smile.

Case 2

Pre Treatment Assessment: Patient with 14 yrs of age complained of irregular upper front teeth. Patient had no relevant medical history and on extra oral examination revealed convex profile, & competent lips. On intraoral examination revealed an Angle's Class II div 2 malocclusion, good oral hygiene, healthy soft tissue, U shape maxillary & mandibular arches and complete overbite. Cephalometric examination revealed a class II skeletal relation (ANB- 9°) with horizontal growth pattern (FMA-21°), decreased maxillary and mandibular incisor inclination and decreased inter-incisal angle.



Fig.6. Pre-treatment Extra Oral Photographs (Case -2)

Diagnosis: Angles Class II div 2 malocclusion.

Treatment Objectives:

Pre-functional Alignment and levelling of the upper arch there by converting the Class II div 2 into Class II div 1 incisor relation. Growth modification using twin block appliance to achieve Class I molar & canine relation

Treatment plan:

Treatment was planned in three stages with the use of fixed pre-adjusted edgewise orthodontic appliance (.022 MBT) in the first stage for pre-functional alignment. Twin block was used during the second stage for correction of skeletal malocclusion followed by the third stage of fixed pre-adjusted edgewise orthodontic appliance for final finishing of the occlusion.



Fig.7. Pre-treatment Intra Oral Photographs (Case -2)



Fig.8. Pre-functional alignment of maxillary arch (Case -2)

Post treatment assessment

- Class I molar & canine relation
- Normal overjet & overbite
- Duration of the treatment was 22 months.

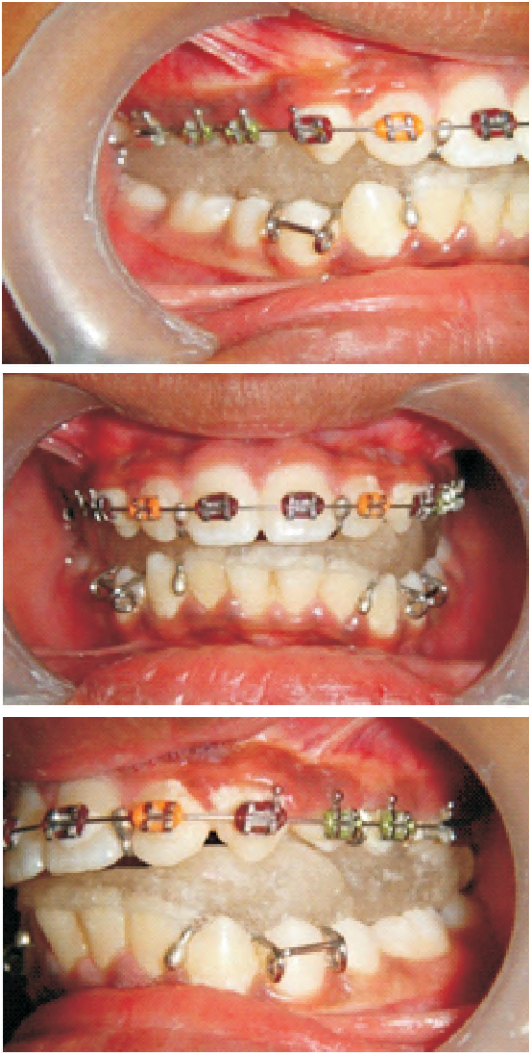


Fig.9. Twin Block Appliance (Case -2)



Fig.11. Post-treatment Intra Oral Photographs (Case -2)



Fig.10. Post-treatment Extra Oral Photographs (Case -2)

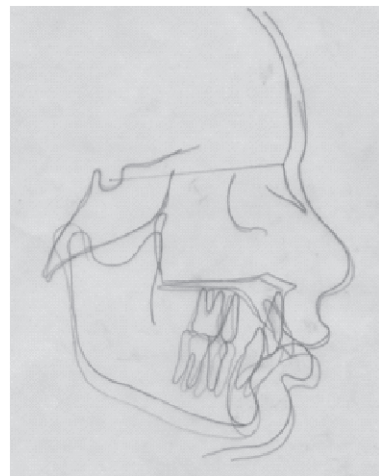


Fig.12. Superimposition of pre-treatment and post – treatment (Case -2)

Table. 2. Cephalometric measurements (Case -2)

Values	Pre - Treatment	Post - Functional	Post-Treatment
SNA	82°	82°	82°
SNB	73°	79°	79°
ANB	9°	3°	3°
FMA	21°	24°	24°
U1 to SN	75°	106°	109°
IMPA	90°	102°	105°
Inter-incisal Angle	168°	125°	120°
Lower lip to E-plane	0 mm	+2 mm	+2 mm

Discussion

The skeletal discrepancy was corrected resulting in bilateral Class I molar & Class I canine relation. (ANB 9° to 3°). The case was successfully managed initially by pre-functional alignment using MBT mechanics and then twin block appliance. Pre functional alignment was done to create proper overjet so that mandible would be repositioned anteriorly. Complete deep bite was corrected by supra-eruption of lower posterior teeth using twin block appliance. Lower lip exhibited normal position in relation to E-plane. Patients had an improved smile.

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