



Class II Correction with Intra Oral Elastics in Adult Class II Div 1 Malocclusion: A Case Report

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Abstract

Case report of a 18 year old male patient reported with class II division 1 malocclusion with reduced overbite, increased overjet, proclined upper anteriors, discordant midline, convex facial profile, posterior divergence on skeletal class II base with normodivergent growth pattern and CVMI stage IV. This case is treated with MBT prescription for the duration of 2 year, class II correction is achieved with the help of intra oral elastic only. The result showed correction of overjet and overbite, with class I molar and canine relation and marked improvement of facial esthetics

Keywords: Orthodontics, class II correction, intra oral elastics.

Introduction

Class II malocclusion is one of the most frequent problem encountered in orthodontics after crowding. This malocclusion is described as distal relationship of the mandible related to the maxilla with a combination of different dental and skeletal components which can affect facial aesthetics and functional status adversely¹. The most common characteristic of Class II malocclusion is mandibular retrognathia rather than maxillary protrusion². Functional orthopedic appliances can be used to treat Class II malocclusion originated from mandibular retrusion for growing patient, but for non growing patients dental camouflage is the treatment modality for mild to moderate class II cases. For this intra oral elastics, fixed functional appliance are the best option as they bring more dentoalveolar correction.

Case Report

A 18 year old male reported to the department of orthodontics with complaint of gap between the upper and lower teeth. Patient had no relevant medical and family history. He had history of thumb sucking habit in child hood till the age of 8 year.

On extraoral examination, the patient had a apparently symmetrical mesoprosopic face with convex profile, posterior divergence & competent lips.

Smile analysis showed a low smile line with a non-consonant smile arc and morley's ratio of 60% (**Figure 1**). Upon intraoral examination the patient had class II molar and class II canine relationship bilaterally, mandibular midline shifted to right by 1 mm, an overjet of 10 mm, overbite of 0%, occlusal features showed symmetric V shaped maxillary arch and an ovoid

shaped mandibular arch with mild crowding in lower anterior region. (**Figure 2**) The periodontal tissues were found to be healthy. The functional examination showed no signs or symptoms of a temporomandibular joint disorder.

Cephalometric findings presented a forwardly placed maxilla with retrognathic mandible resulting in Skeletal class II relation (ANB=6°, Wits=6mm, APP-BPP=9mm, MM bisector=2mm). The patient had a normodivergent growth

pattern as showed by FMA22°, SN-MP 29°, Y Axis 57°, Bjork's sum 392°. Gonial angle 120° along with proclined upper and normally placed lower incisors (Max 1-APog= 8mm, Max 1-NA=33° & 6.5mm, M and 1-APog= -2mm, Md I – NB = 6mm & 23° IMPA=92°). Soft tissue cephalometric analysis revealed protrusive upper and retrusive lower lip w.r.t S and E line, nasolabial angle was 92° with lip strain of 3 mm (**Figure 3**)



Fig : 1 Pre Treatment Extra Oral Photograph



Fig.2 Pre Treatment Intra Oral Photograph



Fig.3 Pre Treatment Radiograph

The panoramic X-ray showed the presence of upper and lower third molars in all quadrant except lower left with no apparent pathologies. (Figure 3)

Study Model analysis showed a total discrepancy of 4 mm in the upper arch and -6 mm in the mandibular arch.

Diagnosis and Treatment Objectives

An 18 year old male with chief complaint of gap between upper and lower teeth has Angle's class II molar and canine relation bilaterally, increased overjet, decreased overbite on skeletal class II base with normodivergent growth pattern and CVMI-IV.

The goal was to obtain a good facial balance with optimum static and functional occlusion. The treatment objectives were:

- Correction of incisor proclination
- Correction of maxilla mandibular midline
- Achieving class I molar and canine relation bilaterally.
- correction of overbite and overjet
- Achieving stable occlusal function
- Achieving optimum soft tissue balance
- Long term retention

Treatment Plan

By considering cephalometric hard and soft findings as well as the study model analysis a

conservative treatment plan was outlined with non extraction fixed orthodontic mechanotherapy

Treatment Progress

The maxillary and mandibular arches were banded and bonded using preadjusted edgewise appliance (MBT 0.022x0.028 slot) and an initial 0.016" NiTi wire was placed for levelling and alignment of the arches. By 4 months, good levelling and aligning was achieved to place upper and lower 0.019 x 0.025-inch SS wires in both arch. Then a crimbable hook was attached to maxillary arch wire in between lateral incisor and canine. Anti rotational bend was added for lower molar to avoid mesiolingual rotation of molar when using class II elastics. A removable appliance with reverse inclined plane was given on maxillary arch .along with class II elastics were used to correct overjet. Elastic was worn around 18 hours in a day for 4 months, then marked reduction in overjet was noticed. bite were opening that time due to extrusion of lower posteriors. So then along with class II elastic box elastics also were advised. Both class II and box elastics continued for 2 more months then overjet reduction was achieved and bite opening was controlled. After achiving proper overbite and overjet 014 inch stainless steel wire used for settling with elastics. The total treatment took 16 months to settle a class II case in class I molar and canine relation.



Fig.4 class II elastics



Fig.5 class II elastics and box elastics

Treatment results

The facial aesthetic was improved with better lip support (**Fig.6**). The smile was enhanced and the consonant smile arc was achieved. Intraorally, ideal overjet and overbite was achieved with Class I molar and canine relationship (**Fig.7**). The post treatment panoramic radiograph showed good overall root parallelism and lack of root resorption. Post treatment lateral Cephalogram (**Fig.8**) showed no change in the skeletal

parameters SNA, SNB, ANB, Wits remain unchanged after treatment, satisfactory improvement is noted in dentoalveolar parameters. The position of upper and lower incisors were improved, upper incisor at 25° and 5mm to NA and the lower incisor at 27° and 7mm to NB with an IMPA of 101°. A favorable change in facial profile angle was seen. A functionally stable and esthetic occlusion was achieved during a period of 16 months. (**Table 3 and 4**)



Fig : 6 Post Treatment Extra Oral Photograph



Fig : 7 Post Treatment Intra Oral Photograph

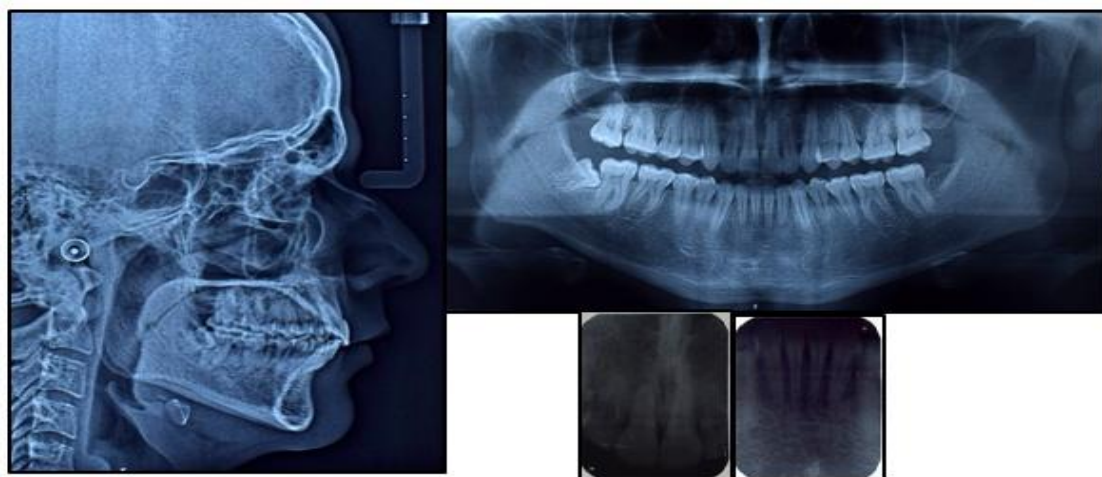


Fig : 8 Post Treatment Radiograph

Cephalometric parameters	Pre treatment	Post treatment
SNA	87 ⁰	87 ⁰
SNB	81 ⁰	81 ⁰
ANB	6 ⁰	6 ⁰
WITS	6 mm	6 mm
N⊥ A point	-2 mm	-3 mm
N⊥ B point	-15 mm	-10 mm
N⊥ Pogonion	-14 mm	-10 mm
FMA	22 ⁰	24 ⁰
SN-MP	29 ⁰	30 ⁰
Bjork	392 ⁰	394 ⁰
Mx I to NA	6.5mm	5 mm
Mx I to NA	33 ⁰	25 ⁰
Md I to NB	6 mm	7 mm
Md I to NB	23 ⁰	27 ⁰
IMPA	92 ⁰	101 ⁰
E – line upper lip	-2.5mm	-3mm
E – line lower lip	-4mm	-2mm
Nasolabial angle	92 ⁰	90 ⁰

SO (Sagittal occlusal) Analysis (Pancherz)

Variables	Pre treatment	Post treatment
Linear Measurements		
Maxillary Base (ss/RLp)	80.5 mm	80 mm
Mandibular Base (pg/RLp)	76 mm	77 mm
Maxillary incisor (is/RLp)	88.5 mm	86 mm
Mandibular incisor (ii/RLp)	77.5 mm	82.5 mm
Maxillary Molar (ms/RLp)	57 mm	56.5 mm
Mandibular molar (mi/RLp)	52 mm	57 mm
Overjet	9 mm	2 mm
Molar relation	+3 mm	-2.5 mm

Retention

Placement of bonded lingual retainer in lower arch and removable Hawleys retainer with reverse inclined plane for the upper arch.

Discussion

Class II elastics are active auxillary force element in fixed appliance system which has been used for class II correction since the early days of orthodontic practice. Some undesirable effects are always associated with class II elastics because of the vertical component of the force vector like extrusion of molars and anteriors, rotation of the occlusal plane, rotation of mandible and may affect smile line. Class II elastics are less effective for skeletal correction which provide more dentoalveolar effect³. Use of class II elastics and acrylic plate with reverse inclined plane which brought retroclination of upper anteriors, proclination of lower anteriors without skeletal

change. Open bite tendency while using class II elastics were minimised by use of box elastics. Since the patient is normodivergent in growth pattern rotation of mandible and occlusion plane did not affect patient's facial easthetics and smile. Bratu (2004)⁴ noted the problems associated with use of elastics include periodontal problem in lower teeth, improper placement of elastics by patient, unwanted rotation or extrusion and unwanted space opening or closing. When comparing effect of elastics with functional appliance many authors found that vertical changes are pronounced in elastic group. Graham Jones (2008)³ studied the effect of class II elastic and Forsus FRD and he concluded that Class II elastics are effective in correcting Class II malocclusions, and their effects are primarily dentoalveolar. They are similar to the effects of fixed functional appliances in the long term, Forsus is more effective for correcting Class II

malocclusion in a shorter treatment period with minimal patient compliance required. Class II elastics are least expensive method of class II correction.

Conclusion

The use of elastics for the correction of class II malocclusion primarily produces dentoalveolar effect since the force of application is small in magnitude and not sufficient to bring skeletal change. Full cusp class II or end on molar relation can be corrected using elastics if the patient's compliance is good. the effect of class II elastic include lingual tipping, retrusion, and extrusion of the maxillary incisors; labial tipping and intrusion of the mandibular incisors; and mesialization and extrusion of the mandibular molars.

References

1. M. Alarashi, L. Franchi, A. Marinelli, and E. Defraia. Morphometric analysis of the transverse dentoskeletal features of class II malocclusion in the mixed dentition, *Angle Orthod* 2003;73;21–25.
2. J. A. McNamara Jr., Components of class II malocclusion in children 8–10 years of age. *Angle Orthod* 1981; 51;3;177–202.
3. Jones G et al, Class II Non-Extraction Patients Treated with the Forsus Fatigue Resistant Device Versus Intermaxillary Elastics. *Angle Orthodontist, Vol 78, No 2, 2008*
4. Bratu DC, Fleser C, Glavan F. The effect of intermaxillary elastics in orthodontic therapy, *TMJ* 2004, Vol. 54, No.4
5. Nelson B, Hansen K, Hagg U. Class II correction in patients treated with class II elastics and with fixed functional appliances: a comparative study. *Am J Orthod Dentofacial Orthop.* 2000;118: 142–149.
6. Jansen et al, Correction of Class II malocclusion with Class II elastics: A systematic review, *Am J Orthod Dentofacial Orthop.* 2000;143:3
7. Nelson B, Hagg U, Hansen K, Bendeus M. A long-term follow-up study of Class II malocclusion correction after treatment with Class II elastics or fixed functional appliances. *Am J Orthod Dentofacial Orthop* 2007;132:499-503
8. Combrink FJ, Harris AM, Steyn CL, Hudson AP. Dentoskeletal and soft-tissue changes in growing Class II malocclusion patients during nonextraction orthodontic treatment. *SADJ* 2006;61:344-50.
9. Uzel .A, Uzel. I, Toroglu MS, Two Different Applications of Class II Elastics with Nonextraction Segmental Techniques. *Angle Orthod, Vol 77, No 4, 2007*
10. Tovstein BC. Behavior of the occlusal plane and related structures in the treatment of Class II malocclusion. *Angle Orthod* 1955;25: 189-98.