

Case Report

Bringing The Mandible Forward; Changing Profile From Non Esthetic To Esthetic: A Case Report

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ABSTRACT

Facial appearance is an important factor that imparts aesthetics in an individual. The field of orthodontics has opened into a broad spectrum that helps to treat the patient efficiently by taking facial profile into account. The growth of the patient can be utilized during the orthodontic treatment planning with the help of myofunctional appliances and fixed functional appliances to prevent orthognathic surgical invention. One such fixed functional appliance is the Forsus Fatigue Resistance Device that can effectively advance the mandible and modifying the facial profile from convex to straight. Forsus appliance uses NiTi coil spring that is activated during the closure of the mouth to forward the mandible. Its design is very effective with minimum discomfort to the patient and the activation are easy with little armamentarium. The following case report gives a brief idea about the device and its advantages.

Keywords: class II malocclusion, mandibular advancement, Forsus Appliance.

Introduction

Malocclusion is defined as the false arrangement of teeth in any three planes of space. A Class II malocclusion may be skeletal or dental or may be a combination of skeletal and dental components. The Class II malocclusion is classified into division 1 and division 2 based on the axial inclination of upper anteriors.

Moore et al.¹ Buschang et al.² and Walkow and Peck³ evaluated the dental casts of Class II division 1 and division 2 and concluded that Class II division 2 malocclusion shows reduced intercanine width. Panchez et al.⁴ evaluated the cephalometric parameters between these two groups and concluded that mandibular retrognathism was a common clinical entity in both the groups. Occlusal forces that are transmitted through the dentition provide a constant proprioceptive stimulus to influence the rate of growth and the trabecular structure of the supporting bone.^{5,6}

The basic features of class II div 2 are as follows:⁷ Orthognathic maxilla and a mild retrognathic mandible, Marked horizontal growth pattern with forwardly rotated mandibular base, Skeletal deep bite, Retroclined upper incisors with

near-normal lower anteriors, Lower lip placed slightly behind E-line with prominent chin, Increased maxillary arch width parameters (intercanine and intermolar width, basal arch width at canines and molars), Restricted mandibular arch width, and hence, increased chances for crowding in the lower arch. The retrognathic feature mainly changes the face to a less appealing to the individual perception. Inadequate antero-posterior length of the lower jaw results in a typical convex facial appearance and Class II malocclusion. The retrognathic mandible often results in concomitant retropositioning of the lower lip.

So in this case we need to accomplish a good facial balance along with the an ideal functional occlusion.

Presenting concerns

A 13 year old female patient came to Rama Dental College & hospital, department of Orthodontics and Dentofacial Orthopedics having a chief complaint of irregularly placed upper front teeth. Upon extraoral examination patient showed convex facial profile with competent lips and retruded mandible. (Fig 1)

Intraorally patient showed retroclined upper and lower central incisors with Angle's class II molar relation bilaterally, Rickett's class II canine relation bilaterally and patient showed reduced overjet of 1mm and overbite of 7mm. (Fig 2) Radiographically (Fig 3) patient had retroclined upper and lower anteriors, average growth pattern, skeletal class II with ANB of 7 deg. Figure 3: Pre treatment lateral cephalogram The diagnosis of the case was skeletal class II jaw base relationship, average growth pattern, Angle's class II division II malocclusion with reduced overjet and increased deep bite. The patient had severe skeletal class II relationship due to retroclined mandible, problem in sagittal direction due to retroclined mandible, the treatment for this case was fixed mechanotherapy with mandibular advancement using Fixed Functional Appliance(Forsus). The basic fixed mechanotherapy with non extraction treatment modality. After bonding with standard 022slot MBT metal brackets, initial levelling and aligning was done using NiTi archwires till 17x 25 ss it resulted to bring the lingually tipped incisors to its normal position to achieve sufficient overjet to advance the mandible forward. The curve of spee is levelled. Mid treatment records were taken. By the time of mid treatment patient has well aligned dental arches with increased overjet to have the VTO positive which is a prerequisite for the placement of Fixed functional appliance. After which the arch wire was shifted to 19x25 ss followed by installation of forsus was done.

After 20 months of orthodontic treatment patient showed excellent profile with class I molar relation and canine relation with good overjet and overbite. Post treatment profile showed improvement in relation to upper incisor and gave a well aligned arches forsus helped in advancement of mandible and class I molar and canine relation with good overjet and overbite with straight profile.(Fig:4) Radiographically patient showed improved axial inclination of upper and lower incisors and lip competency is improved and advancement of mandible was noted. The following table contains cephalometric changes in pre and post treatment radiographs before and after installation of forsus fatigue resistance device.(Table:1)

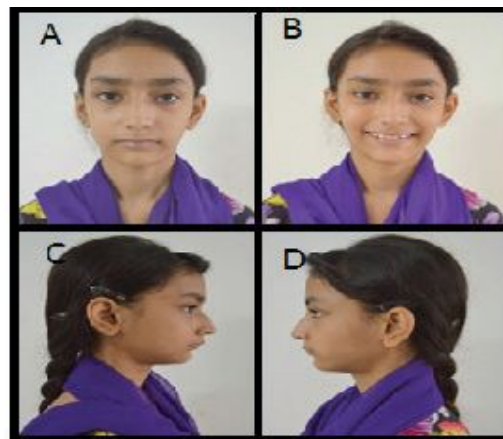


Figure 1: Pre treatment extra oral photographs A: Frontal view, B:Frontal Smile, C: Profile View left, D: Profile view right



Figure 2 pre treatment intra oral photographs A: Frontal view, B: Lateral view right, C: Lateral view left

Discussion

Treatment of class II skeletal malocclusion has always been a challenge for an orthodontist, especially in the deceleration stages of growth. Over the years many fixed functional appliances have been used by orthodontists and only a few have shown well acceptance



Figure 3: pre treatment lateral cephalogram

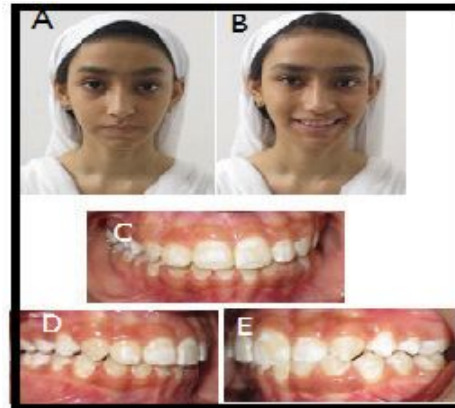


Figure 4: post treatment intra and extraoral photographs A: Frontal view, B: Frontal Smile, C: Frontal view, D: Lateral view right, E: Lateral view left

SL NO	Cephometric values	Normal	Pre Treatment	Post Treatment
1	SNA	82 ⁰	82 ⁰	81 ⁰
2	SNB	79 ⁰	75 ⁰	77 ⁰
3	ANB	3-4 ⁰	7 ⁰	4 ⁰
4	SN-GoGn	32 ⁰	28 ⁰	31 ⁰
5	Jaraback's ratio	62-65%	63.1%	61.3%
6	Upper incisor to NA	25 ⁰	3 ⁰	25 ⁰
7	Lower incior NB	28 ⁰	22 ⁰	30 ⁰
8	Lower lip to E-plane	-2 to 2mm	-4	-1

Table 1

favourable results on the patient. The Forsus Fatigue Resistant Device (FFRD) is a fixed, hybrid functional appliance. As opposed to rigid, fixed functional devices, such as the Herbst appliance, the spring of the FFRD allows flexibility in the position of the mandible. It is considered a noncompliance device, as it is fixed in the patient's mouth and a practitioner does not have to rely on a patient's cooperation. The post-treatment measurements showed favourable sagittal skeletal changes: Sella-Nasion-A Point (SNA) angle remained the same, increase in Sella Nasion-B Point (SNB) angle from 77° to 79°, 3° reduction in A Point-Nasion-B Point (ANB) angle & Wit's reduction of 2 mm. At the end of treatment vertical skeletal changes indicated increase in lower facial height. Schwarz mandibular length increased only by 2 mm, while there was no change in maxillary length. Harvold length increased by 1mm in maxilla and 5mm in mandible was noticed. The dento-alveolar changes showed that maxillary incisors were retracted significantly by 3.5mm linear and 7° angular while mandibular incisors were proclined by 1mm linear and 2° angular. The soft tissue improvement was seen with a trend towards Orthognathic profile (Fig. VI & VII). Our results were in accordance with previous studies that have reported similar findings with Forsus appliances⁸⁻¹². They concluded that the Forsus is an acceptable substitute for Class II elastics for patients who appear to be noncompliant.

Conclusion

The Forsus is an effective and comfortable fixed functional appliance which is very effective in repositioning the mandible in a forward position for the treatment of skeletal mandibular retrognathism. The mandible is free to move laterally while not allowed to move posteriorly. However patient compliance is a minor drawback but well tolerated comparatively. The Forsus may be a comfortable alternative to conventional anterior repositioning appliances.

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