

Fatigue Resistance Device (Forsus) a Class II Corrector

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ABSTRACT

Background: Class II Div 1 malocclusion is the most common problem mainly characterized by mandibular retrusion. Treatment modality aims to stimulate sagittal mandibular growth. Various appliances are available including conventional myofunctional and fixed functional appliance. Fixed functional appliance evolved due to the noncompliance with conventional myofunctional appliances. The present case report discusses the use of Forsus (a type of fixed functional appliance) and its efficiency in correction of skeletal Class II with mandibular retrusion. Stable and successful results were obtained with substantial improvement in facial profile, skeletal jaw relationship and overall esthetics appearance of the patient. Forsus provides good results for Class II management. This allows us to treat such cases by non-extraction approach rather than contemplating extractions.

Keywords: Class II malocclusion, Fixed functional, non-extraction, Forsus.

INTRODUCTION

Class II malocclusion patients form a sizeable number treated by orthodontist. Mandibular retrusion is one of the most common aetiology in production of Class II malocclusion and treated by functional jaw orthopaedics. Management of Class II malocclusion depends entirely on the severity of the problem and the age at which the treatment is carried out. According to McNamara,[1] the most common characteristics of Class II malocclusion is mandibular retrusion rather than maxillary prognathism. A functional appliance treatment for mandibular advancement is often advocated in Class II malocclusion due to mandibular retrusion,[2,3,4,5]. In patients, who have not yet crossed the adolescent growth spurt, removable functional appliance such as activator, bionator, twinblock, and frankel are used,[6]. If patient reports after the pubertal growth spurt or during late stage of puberty fixed functional appliance such as fixed twin block, Jasper jumper, Herbst and Forsus fatigue resistance device are better choice.

Success of the treatment depends to a large extent on patient compliance, which is difficult in removable appliances. Fixed functional appliances are advantageous as their action is for 24 h, smaller in size, less bulky and most importantly patient cooperation is not required, hence providing better result.

The Forsus fatigue resistance device (FRD) (3M Unitek) is an inter arch hybrid fixed functional appliance used for correction of Class II malocclusion with retruded mandible, Class II subdivision and midline correction.

CASE REPORT

A 15- year old female patient reported with the chief complaint of protruded front teeth. Extra-oral examination in frontal view revealed increased incisor exposure and lip incompetency. profile view showed that she had convex profile and nasolabial angle 96° (Figure 1a-c). Intra-oral examination showed RCT treated right upper central incisor, overjet 10 mm, overbite 4 mm, End on molar

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relation bilaterally, Class II canine relation, Class II incisor relation and increased curve of spee. (Figure 2a-e) Orthopantomogram showed full complement of dentition with all third molar present. Cephalometric analysis revealed ANB 5° , increased proclination with maxillary anteriors and average growth pattern. (Figure 3a-b)

Diagnosis: Skeletal Class II relation due to retrognathic mandible, Angle's Class II Div 1 malocclusion



Fig 1: (a-c) Pre- Extra oral photographs.



Fig 2: (a-e) Pre-Intra oral photographs



Fig 3: (a-b) Pre-cephalogram and orthopantomogram

Treatment plan: To correct skeletal class II relation due to retrognathic mandible without any extractions, it was decided to treat this patient with fixed functional appliance, Forsus FRD, in

conjunction with preadjusted edge-wise in single phase using MBT 0.022 slot.

Treatment progress: Complete banding and bonding were done along with soldered Transpalatal arch in upper and soldered lingual arch in lower arches. Leveling and aligning were done until 0.019×0.025 stainless steel wire could be placed passively. Individually both the arches were consolidated from molar to molar. Additional labial root torque was incorporated in lower labial segment of wire. The duration of pre-functional therapy was 8 months.

The Forsus appliance was installed for the duration of 12 months. (Figure 4a-c)



Fig 4: (a-c) Intra oral photographs during Fixed functional therapy.



Fig 5(a-i): Patient after 22 months of treatment.

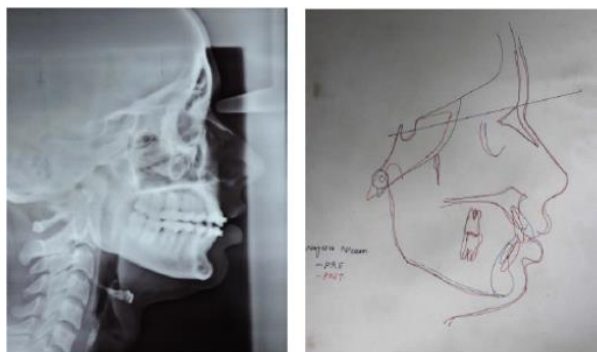


Fig 6(a-b): post-cephalogram and superimposition of pre and post treatment cephalometric tracing.

DISCUSSION

A wide variety of treatment options is available for treatment of Class II malocclusion. Since this patient was in late adolescent stage, it was decided to treat her with growth modulation. As very little amount of active growth was remaining, we could not take a chance for patient compliance and hence fixed functional appliance was used for treatment.

The following changes were seen with this single phase treatment using fixed orthodontic treatment and Forsus: ANB angle reduced from 5° to 3° , upper incisor inclination with respect to palatal plane reduced from 105° to 97° , lower incisors were proclined by 11° , overjet reduced from 10 mm to 2.5 mm (Figure 5f). Occlusion changed from Angle Class II Div I to normal Class I malocclusion (Figure 5g-h). Convexity of the facial profile was reduced.

Fixed functional appliance is reported to cause postero-superior displacement of maxillary dentition and pterygoid plate along with forward displacement of mandibular dentition, thus, can contribute to correction of Class II malocclusion. The advantage of using growth modulation was, it avoided the necessity of premolar extraction and orthognathic surgery.

Table 1: Cephalometric analysis

Cephalometric reading	Pre	Post
SNA	78°	78°
SNB	73°	75°
ANB	5°	3°
UPPER INCISOR TO SN	99°	94°
UPPER INCISOR TO PALATAL PLANE	105°	97°

The use of Forsus appliance helps to integrate the functional and fixed appliance therapy into single phase of treatment and minimizes the duration of treatment. Patient compliance will not be a limiting factor. A favorable change in soft tissue profile with reduction in convexity was seen with this appliance, though the appliance bring about more of dentoalveolar changes than skeletal changes. According to Rabie et al mechanical strain caused by forward mandibular positioning stimulated the cells of the chondroid layer in the glenoid fossa to secrete vascular endothelial growth factor, that results in mandibular repositioning.

CONCLUSION

Extraction correction of Class II malocclusion due to functional mandibular retrusion should be avoided as it can lead to detrimental changes in the soft tissue profile of the patient. Such patients will be very well benefited by treatment using Class II correctors such as forsus. Excellent results can be achieved by limiting the side effects, minimizing the need for patient compliance, and avoiding appliance breakage. Forsus could be one of the best treatment options for Class II correction, especially in noncompliant patients with a drastic improvement in the soft tissue profile and esthetic appearance of the patient by the sagittal forward displacement of mandible ensuring excellent long-term stable results.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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