

Anil Sonara*, Dipti B. Prajapati**, Neha Assudani***, Sonali Mahadevia****

ABSTRACT

We are in the process of discovering new vistas for where technological advances are concerned specially in terms of various appliances. The ultimate aim is to achieve successful orthodontic treatment, with minimal compliance of the patient.

Due to improved technology, the enigma of treating the class II syndrome is palliated. "Out of the box" thinking has become a norm to treat certain situations that were not corrected in non-compliant patients.

Fixed functional appliances are valuable tools introduced to assist in the correction of skeletal class II malocclusion with mandibular retrognathia, Joining hands with technology is a win win situation for both the patient and the orthodontist.

In this direction a case is reported of a 18year old patient undergoing the orthodontic treatment by using Forsus fixed functional appliance.

KEYWORDS: Fixed functional appliance, Forsus, Class II malocclusion, Growth modulation.

Received: 16-06-2015; **Review Completed:** 25-07-2015; **Accepted:** 17-10-2015

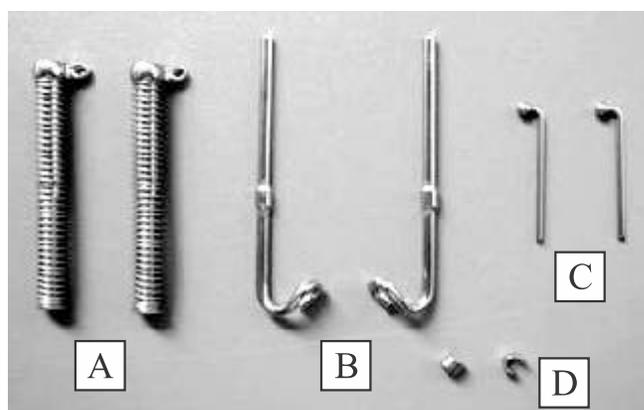
INTRODUCTION:

Every orthodontist at some point in his clinical practice has faced the dilemma of how 'best' to manage class II malocclusion. Treatment of class II malocclusion has always been a mind boggler to the orthodontic fraternity. To obtain the foremost result with skeletal class II malocclusion, the Etiology and diagnosis of malocclusion is the key for achieving the predictable and stable result as we move in the new millennium, there is still controversy about management of class II patients with maxillary prognathism, mandibular retrognathism or both¹.

Case reports of skeletal class II malocclusion with mandibular retrognathism at the end stage of the growth treated by the fixed functional appliance, Forsus™. In this case If camouflage would have been attempted, by removing upper premolars without any maxillary dento alveolar excess can lead to detrimental changes in the soft tissue profile of the patient, leading to a typically dished in profile².

The Forsus Fatigue-Resistant Device (FRD) is an interarch push spring that produces about 200 gm of force when fully compressed. The FRD can intrude the maxillary first molars and thus help in correcting class II malocclusion without opening the bite³.

Components of forsus:³



- A. Three piece telescopic devicesurrounded by a NiTi open coil spring
- B. Direct push rod
- C. Universal "L" pin connector
- D. Universal split crimp

Diagnosis and Etiology:-

a 18year old female patient complained of forwardly placed upper front teeth. she was not satisfied with her facial appearance.

* PG Student, ** PG Student, *** Senior Lecturer, **** Professor And Hod

DEPARTMENT OF ORTHOBONTHCH AND DENTOFACIAL ORTHOPAEDICS
AHMEDABAD DENTAL COLLEGE AND HOSPITAL.

ADDRESS FOR AUTHOR CORROSPONDENCE : Dr. DIPTI B. PRAJAPATI , TEL: +91 8128171762



Fig.1 Pre-treatment extraoral photographs

Clinical examination (fig. 1) showed mesocephalic facial form with horizontal growth pattern, convex profile, competent lip posture average nasolabial angle, deep mento labial sulcus. Functional examination revealed hyperactive mentalis muscle activity.



Fig. 2 Pre-treatment intraoral photographs

On Intraoral examination (fig. 2) molars were in class II relationship, with end on canine relation on both sides with increased overjet and overbite, incisor relationship was class II div I, constricted maxillary arch, Proclination of upper and lower anteriors, mild crowding of lower anterior teeth, and Upper and Lower dental midline is not coincided with the facial midline. it is shifted on right side.

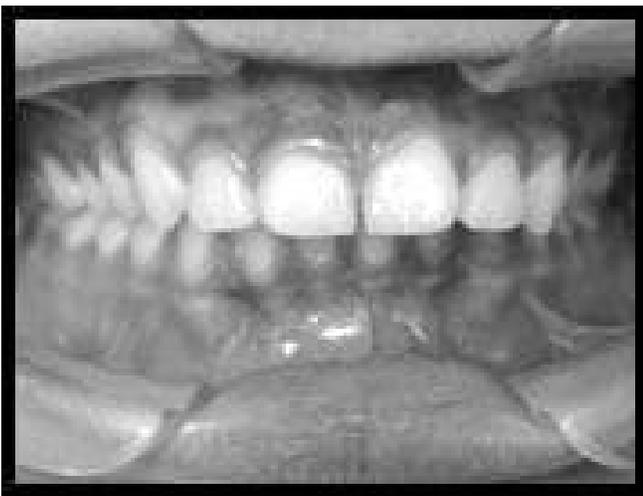
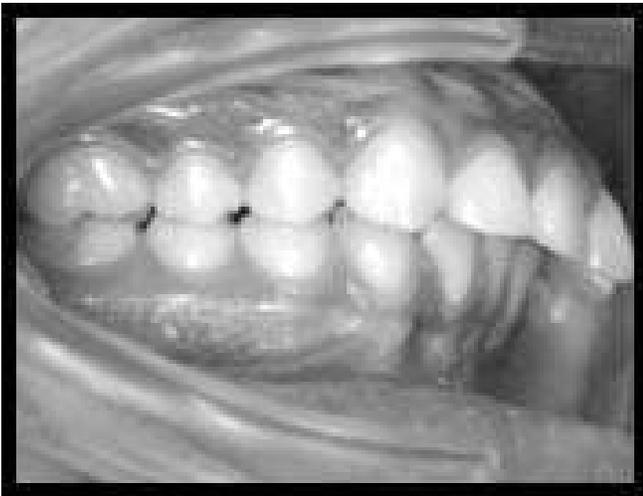


Fig. 3 VTO positive in the patient

Cephalogram (fig. 3) revealed skeletal class II malocclusion with orthognathic maxilla and retrognathic mandible. Orthopantomogram (OPG) revealed impacted 3rd molar in all 4 quadrants.



Fig. 4 Pre-treatment Lateral Cephalogram



Fig. 5 Pre-treatment OPG

Treatment Objectives:

The objectives of treatment for this patient were to correct the retrognathic mandibular position, to correct constricted upper arch, to achieve class I molar and canine relation, to correct proclined upper and lower anterior teeth and establish stable functional occlusion with ideal anterior overbite and overjet. Correction of Lower dental midline.

Treatment progress:

Treatment started with PEA (Pre-adjusted edgewise appliance) technique and fixed mechanotherapy (MBT prescription) 0.022 slot brackets; alignment was carried out by .016 NITI in both arches.

16 * 22NITI in both arches was engaged initially.

Then 19*25 Stainless steel was given in upper arch and in lower arch 16*22 NITI was continued. Mild curve of spee was given in both the arches. Then 19*25 Stainless steel was given in the lower arch and the forsus appliance was engaged.

For Forsus placement, length was measured from distal end of upper first molar to distal end of lower canine, and placed along with anterior labial root torque in lower arch and crimpable hook distal to canine in both sides. The treatment with forsus appliance continued for 8 months.

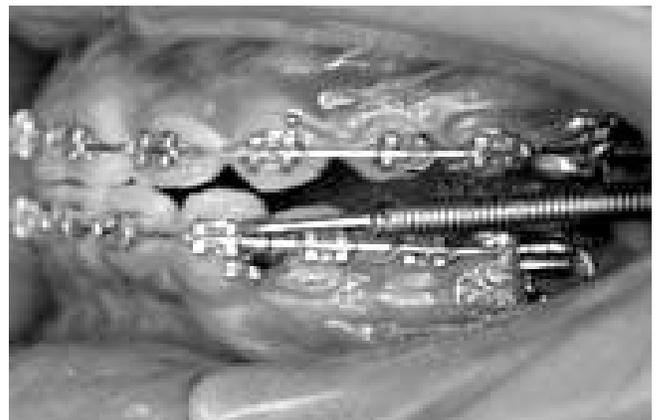
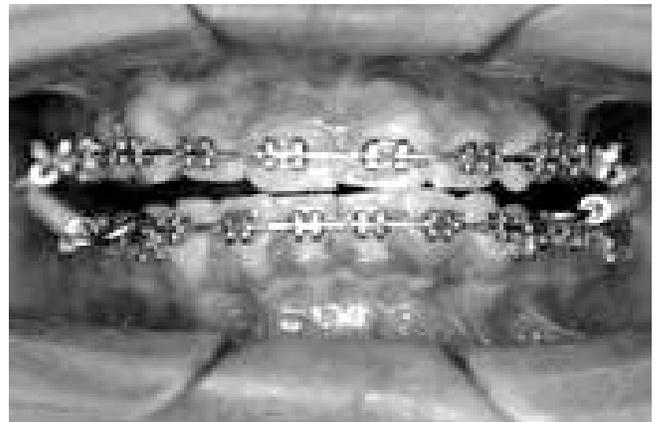
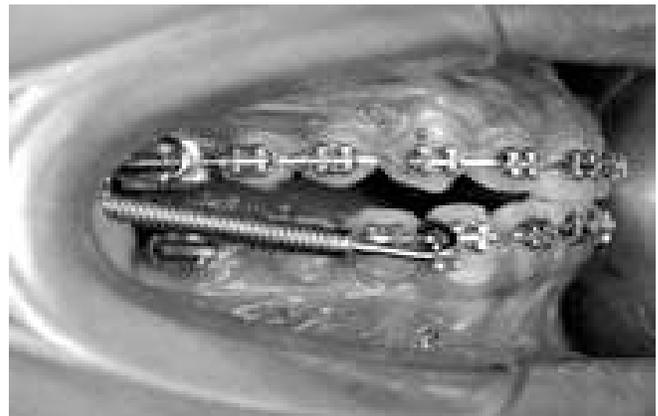


Fig.6 forsus placed after alignment of arches.

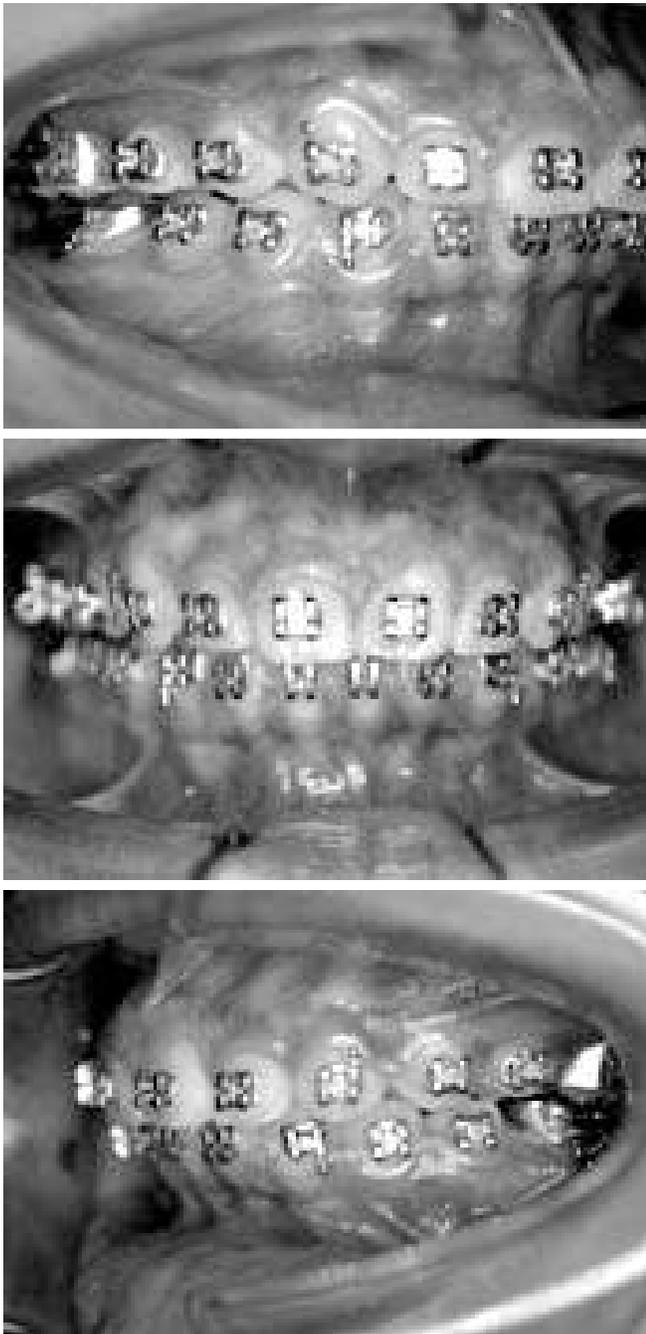


Fig.7 Post-forsus intraoral photographs



Fig. 8 post-forsus extraoral photographs

Discussion:

Class II malocclusions resulting from mandibular retrusion are generally treated with functional orthodontic appliances that create orthopedic forces directed at the mandibular structures. These appliances influence the jaws via the following mechanisms: remodelling of the mandibular condyle, remodelling of the glenoid fossa, repositioning the mandibular condyle in the glenoid fossa, and autorotation of the mandibular bone⁴.

Functional appliances are valuable means of correcting sagittal discrepancies caused by retrognathic or repositioned mandible. In recent years, the use of fixed functional appliances has been increasing specially in non-compliant patient. These appliances also help to integrate the functional and fixed phases of treatment into a single phase treatment. The overall treatment duration is therefore reduced. So fixed functional appliances are boon for orthodontist faced with non-compliance having mandibular retrognathia⁵.

The Forsus Fatigue-Resistant Device (FRD) is persuasive because it is capable of achieving class II correction in 3 to 6 months depending upon the baseline situation and the biological response. The correction achieved is by a combination of skeletal and dental effects, 66% being dental and remaining 34% skeletal⁶.

Thus, Forsus FRD offers the following advantages to the clinician:-

1. Predictable results⁵.
2. Long term reliability⁷.
3. Can be used in non-compliant or handicapped patients⁸.
4. Ease of installation (can be installed and removed in 5 minutes, and is activated in 30 seconds)⁹.
5. Less breakages and robust in clinical usage¹⁰.
6. Shortens the duration of treatment⁷.
7. Can make use of residual growth even beyond the pubertal growth spurt¹⁰.
8. Susceptibility to mechanical fatigue is negligible due to the spring¹.

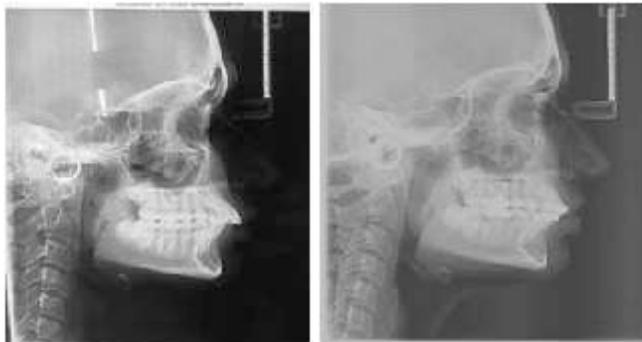
For patients

1. It allows freedom of jaw movements⁵.
2. No tissue impingement⁵.

Result:

Table 1. case analysis	Pre treatment	Post treatment
SNA	81°	81°
SNB	77°	79°
ANB	4°	2°
FMA	18	20
SN GO GN	22	23
Upper incisor To NA	41° 9 mm	25° 4mm
Lowc incisor To NB	26° 4mm	29° 6mm
IMPA	104°	111°
Overjet	9mm	2mm
Basal Plane Angle	19°	20°
Y-axis	54°	56°
Jaraback ratio	66.3%	67.2%
FMA	18°	20°
Lower gonial angle	64°	67°

Normal functional occlusion was established with normal anterior overbite and overjet. Distalization and intrusion of maxillary posteriors and forward placement of lower teeth and Proclination of lower anterior. The mandibular asymmetric retrognathism was eliminated, the patient's facial asymmetry was much improved with harmony of dental arch and orofacial functions.



Pre treatment cephalogram Post forsus cephalogram

Fig. 9 Comparison of pre and post forsus cephalogram:-

CONCLUSION:

It is known that most class II situations are on account of a functional retrusion of the mandible.

The dilemma today for any thinking orthodontist is how to achieve treatment objective with each guru offering an orthodontic heaven if proper technique and appliance are used.

This fixed functional appliance deals with the type of class II malocclusion which represents a gamut of challenges the clinician faces.

We have seen that these are best managed by a non-extraction approach of mandibular advancement wherein Forsus FRD is the treatment of choice, especially for non-compliant patients with stable result.

BIBLIOGRAPHY:

1. Halkati M.B.,Nuzhat Mansuri.Class II correction with forsus – 2 case reports.JDOB-2011
2. Ritoo A.K,Ferreira A p .fixed functional appliances-classification functional orthod 2000; 17: 12-30,32.
3. William Vogt. TheForsus Fatigue Resistant Device. Journal of Clinical Orthod. June 2006;11:368-77.
4. Pancherz H, Ruf S, Kohlhas P. “Effective condylar growth”and chin position changes in H e r b s t t r e a t m e n t : a cephalometricroentgenographic long-term study. Am J Orthod DentofacialOrthop 1998;114:437-46.
5. Nina Heinig, Gernot R. Goz. Clinical Application and Effects of the Forsus TM Spring– A Study of New Herbst Hybrid. Journal of Orofacial Orthopedics.2001;6:436–450.
6. McNamara JA Jr, Bookstein FL, Shaughnessy TG. Skeletal and dental changes following functional regulator therapy on Class II patients. Am J Orthod. 1985;88:91-110.
7. Dennis G. Dionne. Clinical Trial Report: ForsusTM Fatigue Resistant Device. Orthodontic Perspectives – Winning Combinations. 2002;IX: 11-12
8. O'Brien K, Wright J, Conboy F. Effectiveness of treatment forClass II malocclusion with the Herbst or Twin-blockappliances: a randomized, controlled trial. Am J Orthod Dentofacial Orthop. 2003;124:128–137.
9. A Korrodi Ritt. Fixed Functional Appliances – A Classification (Updated). Orthodontic Cyber Journal. Classification (Updated). <http://www.oc-j.com/june01/rittoffa.htm>.
10. Jim Cleary, Bill Wyllie. ForsusTM Fatigue Resistant Device:Fatigue Resistant by Design. Orthodontic Perspectives Winning Combinations. 2002;IX:13-14