doi:10.5368/aedj.2012.4.2.3.2

# ELASTOMERIC LIGATURES WITH FORSUS APPLIANCE – A CASE REPORT

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**ABSTRACT**

One of the many fixed functional appliances is Forsus appliance. If incremental force is required with this appliance 2mm split crimps are placed onto the mandibular push button to increase pressure on the spring. This article describes a case report of a patient treated with fixed functional appliance therapy where a Forsus fatigue resistant device (FRD) is used with elastic ligatures.

**KEY WORDS: Forsus appliance , fatigue resistant device, Class II malocclusion, elastomeric ties.**

## INTRODUCTION

Class II malocclusion are frequently observed in orthodontic practice. Drosch found the frequency of class II malocclusion to be 37%[1]. McNamara reported mandibular retrusion as the most common characteristic of classII malocclusion [2]. The treatment plan for such cases is use of removable or fixed functional appliances (FFA)[3,4,5]. Herbst was the first FFA introduced by Emil Herbst in 1905 . this was followed by Jasper Jumper (JJ) in 1987[6].

The Forsus Nitinol Flat Spring (FNFS) is another FFA developed by Bill Vogt in 2001[7]. It comprises of Spring bar (Nickle – Titanium) coated with transparent plastic to prevent cheeks from buldging. Studies have been conducted, comparing the efficiency of FNFS with other FFA and both the appliances were found effective in treating Class II malocclusion with nearly same alterations in skeletal, dental and soft tissue parameters [8].

Not surprisingly, many attempts have been made to develop newer appliances with the aim to be more efficient or effective. In the field of healthcare, efficiency can be described as the production of desired results with minimum waste of time, money, effort, or skill[9]. The Forsus™ Fatigue Resistant Device is an innovative non-compliance appliance that has been developed to overcome some of the shortcomings that have been present in previous appliances. The Forsus™ Fatigue Resistant Device (FRD) consists of a three piece, telescoping nickel-titanium spring that is attached to the headgear tube of the maxillary molar band via an L-pin. The spring assembly is connected to the mandibular arch by a push-rod, which attaches directly onto the mandibular archwire either distal to the canine bracket or distal to the first premolar bracket.[8]

The FRD offers some advantages over earlier non-compliance appliances. First, it may be assembled chair-side in a relatively short amount of time because the device consists of only three parts. Second, the FRD is completely compatible with complete fixed orthodontic appliances. In contrast to other non-compliance appliances, the FRD can be fabricated and incorporated into the orthodontist's pre-existing appliance, with the only stipulation being that the maxillary molar bands have headgear tubes. No additional crown fabrication is necessary. This feature provides the orthodontist a range of adaptability in treatment because the FRD can be added to or removed from the patient's full appliances at any time. FRD offers Class II correction alternative that can be installed immediately for non-compliant patients.

The Forsus Fatigue Resistant Device(FRD) is an interarch push spring that produces about 200g of force

**Fig.1 Preoperative extraoral photograph showing Meso-cephalic, mesiofacial facial form with incompetent lips and convex profile.**

**Fig.2 - Intraoral photographs showing end-on Molar relation, missing lower central incisors and lower anterior spacing, Increased overjet and overbite with proclined upper and lower incisors.**

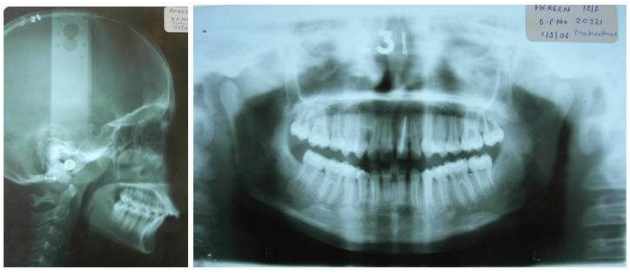

**Fig.3 Preoperative cephalometric and panaromic radiograph showing missing lower cental incisors, root canal treated upper left central incisor and dental age as 12 to 14 years.**

**Fig.4. Small diameter elastomeric ties were inserted into the push rod to achieve the desired increment and the push rod is inserted into the telescopic spring.**

**Fig. 5 Aligning and leveling in prefixed functional stage using Upper and Lower-0.019"x 0.025" SS wires.**

**Fig.6 Post Functional Intra Oral photograph. The case was finished with Class III molar relation.**

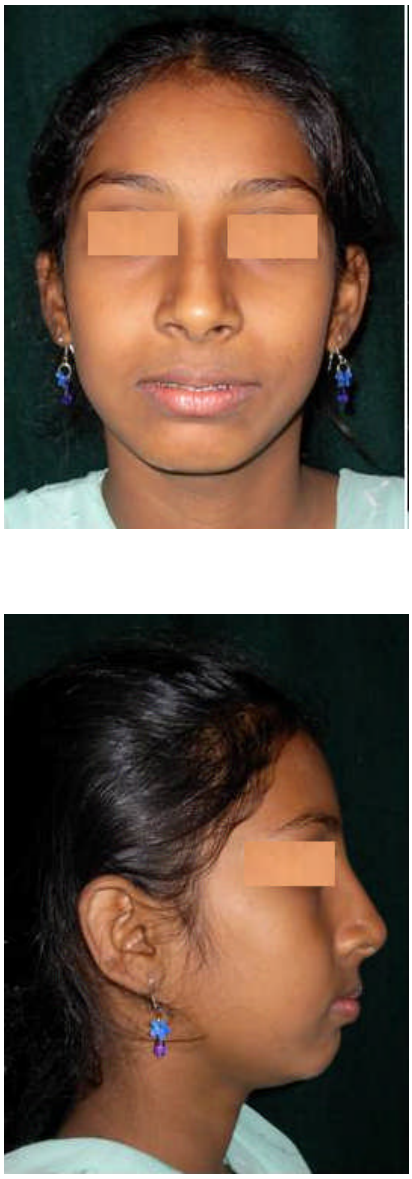

**Fig. 7 Postoperative extraoral photographs.**

when fully compressed[10]. Like other non-compliance appliances, the FRD is not free of drawbacks. Breakage isnot eliminated and the spring and push-rod are bulky, with a potential for patient discomfort and soft-tissue injury. The FRD also requires a moderate amount of inventory and additional expense.

Incremental forces (if required) are created by placing 2-mm split crimps onto the mandibular push rod which increases the pressure on the spring. This article presents a new method of giving this incremental force with the use of an elastomeric tie which is cheap and easily available in an orthodontic clinic.

## Case report

A 12years old female patient reported with chief complaint of upper anterior teeth emerging out of mouth. Extraoral examination showed mesocephalic, mesofacial facial form with convex profile and incompetent lips**(Fig.1).** Intraoral examination reveled root canal treated upper left central incisor, end-on Molar relation, Class I on right and end-on on left Canine relation, Missing lower central incisors and lower anterior spacing. Increased overjet of 10mm and overbite of 4mm and proclined upper and lower incisors **(Fig.2).** Panaromic radiograph revealed the dental age to be between 12 to 14 years. Cephalometic finding showed class II skeletal malocclusion with mandibular baseline deficiency of 4 – 5 mm**(Fig.3).**

Treatment planning - It was planned to undergo non extraction line of treatment. The case was banded and bonded with PEA 0.022 slot MBT prescription. To correct the convexity of profile it was decided to use fixed functional therapy using Forsus appliance with elastic ligatures (**Fig.4**) . Leveling and aligning was done using Upper and lower 0.016" NiTi (Nickel -titanium) wires followed by Upper and Lower: 0.019"x 0.025" NiTi wires and finally Upper and lower 0.019"x 0.025" SS(Stainless steel) wires(Figure5). The case was finished with Class III molar relationship as lower central incisors were missing (**Fig. 6 and 7**).

## Discussion

Whenever advancement is required in the forsus appliance, crimps need to be placed in the push rod. However these crimps are provided in limited quantity and in case if the supply of crimps is exhausted and the patient needs further advancement, then elastomeric ties can be used. [11]

The spring is compressed with one hand and the push rod is held with a plier to stabilize it. The patient is asked to open wide and the spring is further compressed till the push rod disengages from it. In the present case small diameter elastomeric ties were taken and inserted into the push rod and the desired increment achieved. The push rod is again inserted into the telescopic spring. The advancement can be achieved similarly on both the sides. This provides an easy and effective way of achieving incremental forces with the appliance.

## CONCLUSION

The case report describes an easy an effective way of achieving incremental force using elastomeric ligature with FORSUS appliance fixed functional therapy.

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