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INTRODUCTION

Class II malocclusion is one of the most frequent problems in orthodontics, as it affects one third of patients seeking orthodontic treatment. According to McNamara, the most common characteristic of Class II malocclusion is mandibular retrusion, rather than maxillary prognathism. Thus, among the various orthodontic appliances introduced to treat Class II malocclusion, functional orthopedic appliances are widely used. Contrary to removable appliances, fixed devices do not require the patient’s collaboration and can be worn in association with multibracket therapy, so that Class II malocclusion can be corrected in a single phase treatment. Fixed functional appliances can be grouped into rigid or flexible devices. The most commonly used rigid fixed functional appliances are the Herbst and MARA. Most popular flexible devices are the Jasper Jumper, Eureka and the Forsus device (FRD).

The FRD is a three-piece (L pin module) or two-piece (EZ2 module) system, composed of a telescoping spring that attaches at the upper first molar and a push rod linked to the lower archwire, distal to either the canine or first premolar bracket. The appliance is relatively well accepted by patients who may experience some initial discomfort and functional limitations that generally diminish with time.

The dental, skeletal, and soft tissue short-term effects of comprehensive fixed appliance treatment combined with the FRD in Class II patients were evaluated previously.

The current case discusses about a 16 year old female patient with Class II division 1 malocclusion who was treated with Forsus fixed functional appliance.

Case report

A 15-year-old female patient reported in the orthodontic clinic with the chief complaint of poor esthetics due to forwardly placed upper front teeth.

Extra-oral examination

The patient had an apparently symmetric face with mesoprosopic face form and incompetent lips. On profile examination patient had a convex facial profile. The smile of the patient was symmetric and consonant with 100% maxillary incisor display on smiling. (Figure 1)

Intra-oral examination

Revealed all teeth in upper & lower arch are present till 2nd molar. U shaped upper & lower arch. The gingival health was satisfactory. Class II molar & canine relationship bilaterally. (Figure 2)

Functional examination

Patient showed normal speech pattern, oronasal breathing and...
a typical swallowing pattern. The path of closure of mandible was normal.

Examination of study casts

Showed apparently symmetrical arches with a Class II molar & canine relationship. There was 8mm overjet and 5mm overbite.

Cephalometric analysis

Revealed that patient was in CVMI stage VI (completion) and had Class II skeletal bases with low angle case and, proclined upper & lower incisors.

The soft tissue analysis revealed a protrusive upper lip and normal lower lip with an acute nasolabial angle. (Figure 5)

Diagnosis

Skeletal Class II malocclusion with retrognathic mandible & horizontal growth pattern; Angle’s Class II division 1 malocclusion.

Problem List

- Convex facial profile with incompetent lips
- Skeletal Class II due to retrognathic mandible
- Upper & lower proclination
- Increased overjet & overbite
- Class II canine & molar relationship

Treatment Objectives

- To improve facial profile
- To correction proclination of upper & lower arch.
- To achieve normal Overjet and Overbite
- To correct Class II canine & molar relationship

Treatment progress

An MBT 022 in pre-adjusted edgewise appliance was bonded in upper and lower arch. Initial leveling and alignment was done with wire sequencing 0.014 in, 0.016 in, 16 x 22 in, 17 x 25 in Niti wire, 16 x 22 in SS, 17 x 25 in SS, 19 x 25 in SS, 21 x 25 in SS wire. After initial leveling and alignment a labial root torque was given in 19 x 25 in SS wire and after upper, lower arch consolidation a Forsus FRD appliance was placed in the mouth. (Figure 3)
The Forsus appliance was continued for 6 months and after appliance removal settling of occlusion was done for 3 months.

RESULTS

At the end of the treatment there was significant reduction in overjet, overbite (Table No.1) and molar relationship. In sagittal plane upper molar showed slight retrusive effect, upper incisors showed retroclination (1-NA), mesialization of lower molars and lower incisor proclination (1-NB). In vertical plane lower incisors showed intrusion and upper molars also showed some intrusion (U6-NF). Mandibular plane angle also opened (Yaxis, FMA), convexity of profile improved but no skeletal changes were seen. (Figure 4, 5, 6, 7) (Table No.1)

DISCUSSION

Only few studies evaluated treatment and post treatment effects induced by fixed rigid functional appliances, while no previous study assessed the post treatment effects of flexible appliances.

In a recent study, it was reported that 87.9% of the patients were able to adapt to the FRD. In those patients that do not adapt to this appliance, treatment alternatives like Class II elastics can be taken into account.

In our case the effects seen mostly dentoalveolar. These results were similar to those described by Franchi et al. The FRD revealed to be an effective tool in inducing a significant dentoalveolar correction of Class II malocclusions. Significant decreases in both overjet and overbite were recorded (6 mm and 3 mm, respectively), as well as a net improvement of the molar relationship (5 mm). The upper incisors exhibited a significant amount of retrusion (2°). The most relevant dental changes occurred in the lower arch with the lower incisors demonstrating significant protrusion (1mm), and a large amount of proclination (4°). These results were similar to those reported by Baccetti et al. for the Herbst appliance, Siara-Olends et al. for the MARA, and Franchi et al.

A general overview of the outcomes of FRD in combination with fixed appliances revealed that main effects of this treatment are located at the dentoalveolar level, with significant corrections of overjet, overbite, and molar relationship.

CONCLUSION

- The FRD protocol revealed to be effective in correcting Class II malocclusion mainly at the dentoalveolar level.
- Sagittal changes mainly were lower incisor proclination, mesialization of lower molar, retrusive effect on upper incisors and molar.
- Vertical changes included lower incisor and upper molar intrusion and opening of mandibular plane angle

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References