Correction of Class II Subdivision Malocclusion with the Forsus™ Appliance

by Dr. Don Murdock

Introduction

As a clinician, I find myself continually searching for efficient and predictable treatment methods which are also well received by our patients. The Forsus™ Fatigue Resistant Device has become my preferred method for correcting a unilateral Class II malocclusion with minimal cooperation and a high degree of predictability.

When treatment planning a subdivision malocclusion, it is important to differentiate the degree of dental and skeletal involvement. As such, at the new patient examination we routinely perform a brief facial analysis on the computer monitor. In addition to the dental malocclusion, the facial proportions as well as the dental and skeletal midlines are noted and initially discussed with the patient and/or parent.

After facial and radiographic analysis, along with review of dental models, the treatment goals are formulated. If a large discrepancy exists between dental and facial midlines, ancillary treatment including temporary anchorage devices (TADs) or asymmetric extractions may be required. A true skeletal asymmetry is optimally treated in conjunction with distraction osteogenesis or orthognathic surgery. The ideal case for unilateral correction with the Forsus appliance is one in which the maxillary midline is nearly coincident with the facial midline, the mandibular incisors are either upright or slightly retroclined, crowding is mild to absent and the asymmetry has a predominately dental component.

Case Report

A 15 year-old Caucasian female presented for correction of a deep bite, crowding and an “overbite”. Preliminary examination indicated that the patient’s nasal tip deviated slightly right and soft tissue menton was slightly left of the facial midline. The patient exhibited approximately 70% incisal overlap and a dental midline discrepancy of 3 mm. The patient exhibited a full step Class II dental relationship on the left with mild to moderate crowding of the lower incisors. (Figure 1A-E)

Figure 1A: Facial Proportions (red), Facial midline and horizontal plane (black).

Figure 1B: Mild lower lip eversion and mild mandibular retrusion in profile.
Without the TPA, the force generated at the attachment point of the Forsus appliance spring to the maxillary molar may have the additional favorable side effects of slightly rotating distal and expanding the attached molars. If no maxillary arch expansion is desired, buccal crown torque may be incorporated in the archwire.² Clinicians have reported some temporary bite opening or canting of the occlusal plane with fixed functional appliance use, so monitoring progress at 6 week intervals may be advisable.

The Forsus appliance was activated with a 2 mm advancement twice over the 11 months it was in place. The patient wore conventional Class II elastics on her right side after school (at home) and at night for mild correction of her cuspid relationship on that side. Midlines and overbite were corrected after 9 months of Forsus appliance use, with the two additional months being used to create 1-2 mm of overcorrection. Bite opening on the left side of 2 mm from overcorrection with the Forsus appliance required pm vertical elastic wear to the cuspid on the affected side for two months. Total time for fixed upper and lower appliances was 24 months. Treatment objectives were met and the patient and her parents were very pleased with the result. Bonded lingual retainers were placed on maxillary incisors and from mandibular cuspid to cuspid.

Summary

In my experience, the Forsus appliance has earned a reputation for reliability and ease of use. My clinical staff have been trained to place and remove the appliance with minimal chair time, especially with the newer Forsus™ Fatigue Resistant Device EZ Module. Fortunately, the breakage problems associated with Herbst® or various spring-type fixed functional appliances have not been an issue with this fatigue resistant design spring. Use of this appliance does not have the disadvantage of significant molar extrusion as often noted with Class II elastics.³ The unilateral correction of the Class II subdivision malocclusion is one of several clinical uses for this appliance which produce excellent results in an efficient manner. (Figure 3A-F)

Treatment Objectives

The primary treatment objectives for this patient were to decrease the curve of Spee, overbite and overjet. Correction of the Class II dental relationship as well as alignment of dental and facial midlines were also planned. Finally, transverse development of both arches, a decrease in lower lip eversion and overbite were also desirable.

Patient cooperation was considered questionable, and a Forsus appliance spring was discussed and agreed upon by patient and parents for correction of the Class II relationship on the left. Maxillary incisor position and lip support were adequate, which indicated overjet correction resulting from primarily mandibular skeletal and dental advancement would be desirable. Overjet correction with the Forsus appliance has been previously described as approximately one third advancement of the mandibular dentition, one third distalization of maxillary molars and one third via skeletal changes (advancement of the mandible and headgear effect on the maxilla).¹

Upper Clarity™ MBT™ Appliances with 0.019 x 0.025 archwires were placed and the maxillary arch leveled for two appointments, after which, lower Victory Series™ MBT™ fixed appliances were placed. After a few wire successions at subsequent appointments to level and align the mandibular arch, the 0.019 x 0.022 maxillary and 0.019 x 0.025 mandibular stainless steel working archwire sizes were inserted with the Forsus™ Fatigue Resistant Device. The entire lower arch was continuously ligated with stainless steel ligature wire to prevent spacing and excessive proclination of the mandibular arch. Lingual crown torque may be incorporated into the mandibular arch as an additional step in preventing excessive proclination of incisors. If additional maxillary molar distalization is desired, a 0.018 stainless archwire may be placed in the upper arch to decrease frictional forces during translation and a lower lingual arch may be utilized² (Figure 2). If less maxillary molar movement had been desired, a fixed transpalatal arch (TPA) would be placed.
References


Clinical images provided by Dr. Murdock.