Effective Treatment of Class II Deep Bite in Adult Cases

by Dr. Michel Di Battista

Class II deep bite in adult cases

The treatment options regarding most Class II deep bite adult cases with mild to moderate crowding are: decompensation of the dental arches and mandibular surgical advancement (with or without genioplasty), or extraction of two upper premolars with a less-favorable facial aesthetic outcome.

“Class II adult deep bite” is a very vague label. Periodontal status, lip seal, incisor showing, transverse dimension, tongue size, and sleep apnea, to name just a few, are among the factors that influence whether to elect a combination of orthodontic treatment and maxillofacial surgery or an alternative.

In 1996, Dr. John P. De Vincenzo made Eureka Springs pushing Class II correctors available. The first patients I tried them on were partially to almost fully corrected within three months. While it is true that these first patients were still growing, I knew the change was too fast to attribute to regular growth. I felt I had a dentoalveolar phenomenon on my hands.

I was soon using them in cases that were significantly beyond the growth period, with amazing outcomes and very stable results (no dual-bite, no “postural orthodontics” and negligible CR-CO discrepancies).

Fourteen years ago, 3M launched the Forsus Fatigue Resistant Device. It delivers the same results, but with significantly fewer breakages and emergencies than the products I used early on. I use Forsus correctors exclusively now.

The purpose of this article is to demonstrate that the treatment alternative of employing 3M Forsus Class II correctors is not just a second-best alternative, but the treatment of choice in selected cases, all factors and risks considered.

The following case reports are adult Class II deep-bite patients treated with the Forsus Fatigue Resistant Device without extractions and without maxillofacial surgical procedures.

Case No. 1

This case involves a 38-year-old woman. She came in for a second opinion because she declined the surgery suggested by the previous orthodontist. Chief complaint: “I am hurting myself at the palate.”
It was with reasonable confidence that I suggested a nonsurgical treatment with the use of the Forsus Fatigue Resistant Device. The patient was informed and agreed that a plan B would involve extraction of upper 5’s or surgical advancement of the mandible (Figs. 1A-1G).

The treatment sequence was as follows:

05-30-07: Bonding upper arch (centrals 12° torque, laterals 8° torque, 3M Clarity Ceramic Brackets). Final wire size .016 x .022 SS.

01-21-08: Bonding lower arch (-5° torque on incisors). Final wire size .016 x.022 SS.

05-27-08: Day of Forsus correctors installation. 25mm rods on both sides. An .016 x.022 SS wire was inserted on lower arch. At this time the lower Curve of Spee is not totally flattened. The Forsus correctors will assist the leveling of the lower Curve of Spee. Compression of the springs at initial insertion: 6.0mm x 18.5g = 111g per side (Figs. 2A-2C).

08-17-08: Forsus correctors 29mm rods each side, compression 6.0mm.

04-22-09: Forsus correctors stopped when normal overbite and overjet is achieved (Figs. 3A-3C).

The Class II correction is held and stabilized with a decreasing wear of Class II elastics (6mm – ¼”) light 1.8 oz. latex per side from mesial of 3’s to lower 6’s.

08-10-09: Fixed appliances removal. Fixed lingual retainers .016 round SS on #13 to #23 and #33 to #43.

11-16-10: Final records; upper incisors correction torque to occlusal plane = +30°. Lower incisors to occlusal plane change = none.


03-23-11: Control visit: Overjet = 3.1mm CR-CO Slide = 0.4mm.

Patient very satisfied with results. “The results are far beyond my expectations,” she told me (Figs. 4A-4D).

Active treatment time: Three years and three months.

11-16-10: Final records; upper incisors correction torque to occlusal plane = +30°.

11-17-08: Forsus correctors 32mm rods each side, compression 8.0mm.

01-29-09: Reactivation with the addition of split crimps totaling 148g per side.

04-22-09: Forsus correctors stopped when normal overbite and overjet is achieved (Figs. 3A-3C).
Case No. 2

This was a 53-year-old female with the chief complaint of, “My teeth are crooked, and my mouth and lips are going backward, deeper and deeper.” She agreed on a “long” 3.5-year treatment involving the Forsus Fatigue Resistant Device. Teeth missing: #18, #24, #36, #37 and #46. Bridge on #35–#38 (Figs. 5A-5G).

The treatment sequence was as follows:

08-22-06: Bonding upper only: Clarity Ceramic Brackets Standard Edgewise (0° torque, 0° ang.) brackets on #12 to #22. 08-16-07: Bonding lower teeth. (It took one year to decompensate the upper teeth torque = +28.5°).

05-13-08: Forsus correctors 25mm rod right, 29mm rod left.

09-24-08: Class I correction achieved, stop Forsus correctors, start Class II elastics.

Restorations done during treatment by the restorative dentist, Dr. Gilles Dulude (Figs. 6A-6D).

07-15-10: Removal of fixed appliances. Lingual fixed retainers .016” round SS, from #13 to #23 and from #33 to #43.

Treatment time: Three years and 10 months.

11-10-10: Final records. No clockwise rotation of the occlusal plane, Op/Sn original = 12°.

Op/Sn final = 14.40°, normal = 14.40°2 (Figs. 7A-7D).

03-24-11: Insertion of occlusal splint Bite Plane type, full coverage on the upper arch without occlusal contacts posterior to the lower canines.1

Overjet = 2.7mm, CR-CO Slide = 0.2mm.

Patient totally satisfied. “The treatment did not seem long!”

Tips for effective use of Class II correction

Case selection

Generally, Class II deep-bite cases are the ones that respond more favorably to this force system. They exhibit a brachyfacial type and a favorable chin component and are often characterized by a counterclockwise canted occlusal plane and normally positioned or retroclined lower incisors.

Class II pushing correctors are powerful clockwise occlusal-plane rotators and upper-arch distalizers. The less originally clockwise rotated the occlusal plane, the better the potential to correct the “point A and point B to the occlusal plane” relationship (Witts). Patients who exhibit pronounced clockwise or canted occlusal plane with much vertical excess, or those with moderate to severe open bite are not ideal candidates for Class II pushing correctors.

Retroclined lower incisors and normal attached gingiva are positive prerequisites. As a result of using Class II pushing correctors, the lower incisors are being intruded (contributing to gingival buildup) and anchored in the thick chin symphysis bone. (Use -5° prescription on lower incisors.)

Decomposition and three-dimensional preparation of the dental arches

Both arches should be prepared and coordinated as in preparation for a surgery at the exception of the lower Curve of Spee.

The Forsus Fatigue Resistant Device will assist the leveling of the lower Curve of Spee.

In Class II Division II cases, make sure the upper incisor’s buccal torque is properly normalized or slightly overcorrected. A little opening of spaces mesial to the upper canines sometimes allows a good interdigitation and overcorrection of the buccal segments without anterior interferences (Fig. 8; p. 42). The mandibular arch should be free to move to a Class I occlusion without any interference. I avoid overcorrecting to an edge-to-edge position.
This traumatic situation may initiate root resorption and unnecessary attrition.

The minute magnitude calibration of the force system

The control of the level of force delivered by an appliance is of paramount importance, not only with regard to treatment efficiency and treatment time, but also “to minimize any iatrogenic effect of treatment from the use of too high force.”

The Forsus Fatigue Resistant Device can be compressed about 12.0mm at a linear constant deflection rate of about 18.5g/mm. It’s important to keep in mind that the force is not constant, but increases constantly by 18.5g for each millimeter of compression.

Ideally, I don’t have the Forsus springs compressed by more than 9.0mm. Initially 5.0mm to 8.0mm of compression is fine, comfortable and efficient.

At each appointment, the activation of the springs’ compression is measured and kept between about 5.0mm to a maximum of 8.0mm, according to the amount of correction needed. The distance from the mesial part of the distal ring “A” to the mesial part of the spring “B” is passive at 28.0mm and fully active at 16.0mm for 12.0mm of total possible compression. The distance is measured at 25.0mm (Fig. 8; p. 42), so the compression is 3.0mm. Activation of 3.0mm to 4.0mm is a good holding and stabilizing activation.

At about 5.0mm to 8.0mm of activation every two months, no upper lingual arch or RPE appliance is required to hold the upper first molars. However, the buccal inclination of the upper first molars has to be carefully monitored. The Forsus corrector activation and the lingual crown torque expressed by the archwire on the first molars have to be coordinated.

Sometimes an additional -10° to -20° of lingual crown torque at the #16 and #26 level may be bent on the .016 × .022 archwire.

By no means should the maximum opening of the jaw dictate the length of the push rods and thus the entire force system. Should a patient open beyond the length of the push rods, he or she can easily be instructed to re-insert them back into place.

If the Forsus corrector is compressed at 7.0mm, it exerts a distal action force on the first molar of about 130g, and as a reaction force, an equal amount of 130g on the archwire hook stop at the distal of the lower canine.

The condyle to fossae relationship

I do not use Class II pushing correctors as functional appliances in growing and non-growing patients. In my office, every time the Forsus springs are employed, the patient should always be able to close back in centric relation and chew on his or her molars. The condyles are never permanently forced out of the fossae. This means no activation beyond 12.0mm.

A few tricks based on extensive experience

The fixed appliances I employ with the Forsus Fatigue Resistant Device can be briefly described as follows:

- Bracket slot size: .018 x .025
- Wire size: .016 x .022 stainless steel
- Torque prescription on #16 and #26: -14° (~14° offset) /3M Victory Series Brackets).

- Torque prescription on #32 to #42: -5°

To prevent the lower incisors from flaring, the usual recommendation is to fill the...
This may be good mechanics, but I’ve found it is less compatible with low physiologic forces and comfort if more adjustments are performed on the archwire during and after the use of Forsus correctors.

1.0mm distal of #33 and #43 to stabilize the crimped hook acting as a bumper to the pushing rod (Fig. 10B).

A bent forward and outward ‘S’ modified crimped stop links the rod (modified) to the archwire (Figs. 10B-10C).

An elastomeric ligature to stabilize the rod “elbow” buccolingually from flipping in the cheek or rubbing against the first premolar bracket. The ‘S’ part of the crimped hook is angulated buccolingually as required (Figs. 10B-10D).

Conclusions

Some Class II, full-cusp adult cases can be treated without extractions or surgical advancement of the mandible. The dentoalveolar changes induced by the Class II pushing correctors Forsus Fatigue Resistant Device are largely sufficient to achieve superb and stable results in selected cases.

References