1. Is There an Evidence-Based Treatment Approach to Treat Class II Malocclusions?

There are so many kinds of treatment options in treatment of Class II malocclusion. When do you start to treat? Which appliance or mechanics do you prefer?

For children with a Class II malocclusion, the debate is not really whether or not it can be corrected, because abundant evidence from clinical practice suggests it usually can. The important questions are: (1) Does treatment started in mixed dentition, when followed by a second phase during adolescence, provide superior results to single-phase treatment delayed until adolescence? (2) Is there enough additional gain for patients, parents, and orthodontists to justify the greater burden of 2-stage treatment?

These questions can best be answered by following children with similar initial malocclusions, who did or did not have early treatment, to late adolescence and the completion of comprehensive treatment in the permanent dentition. For those reasons, we should review randomized clinical trials (RCTs) to get answers about these questions.

In 2007, the Cochrane Library released a systematic review of the efficiency of 2-phase treatment when initiated in patients between the ages of 7 and 9 years to correct Class II.¹ The authors began their search of the literature by accessing electronic databases available and then followed with a hand search of key international orthodontic journals, with no restriction for language. To be included, studies had to be randomized or controlled clinical trials.

The techniques used included various fixed or removable appliances or headgear, with an untreated control group for comparison. The search strategy yielded 185 titles and abstracts and from these, the authors obtained 105 reports for final investigation.

Significant differences were found in final overjet and ANB angle after phase I treatment. But at the end of phase II, the authors found no significant differences in overjet, final ANB, or peer assessment rating (PAR) scores between children who had early treatment, with either headgear or functional appliances, and those who had not received early treatment. Surprisingly, the authors also found that there was no significant difference in the incidence of incisor trauma. According to Koroluk et al., orthodontic treatment should begin right after incisor eruption to reduce the possibility of incisor trauma.²

The evidence suggests that early orthodontic treatment for children with Class II malocclusion is no more effective than one course of treatment when the child is in early adolescence. The only possible influence of early treatment would be the temporary enhancement of self-esteem in early orthodontic treatment group.³
compliance-free, fixed functional appliances have been
developed. Among those fixed functional appliances, I prefer to
use the Forsus™ Appliance in my office. It is compatible with
complete fixed orthodontic appliances and can be incorporated
into preexisting appliances. The Forsus appliance attaches at
the maxillary first molar and onto the mandibular archwire,
distal to either the canine or first premolar bracket. As the coil
is compressed, opposing forces are transmitted to the sites of
attachment.

The action mechanism of Forsus appliance is shown in Figure
1A-C. Pushing force also causes an occlusal plane rotation
(Figure 1C) and the treatment result is very similar with Class II
elastics but the force could be given 24 hours per day, and the
treatment effect can be gained in relatively short time. Other
merits of Forsus appliances are as follows:

- Forsus appliances did not show breakage in 5 million
  compression cycle testing
- Forsus showed consistent forces throughout 5 million
cycle testing
- It is very easy to use
- Fixed functional appliances show breakage problems during
treatment regardless of the appliance type. In case
of appliance breakage by biting or other reasons, Forsus
appliances can be easily repaired at chairside, which is an
advantage compared with other fixed functional appliances.

3. Clinical Case

History and Diagnosis

A 12-year-old female presented with the chief complaint of
anterior crowding (Figure 2A-J). The length of her central
incisor root was little bit short. Her mother told me that she
frequently suffered from the common cold and inflammatory
tonsillar hypertrophy. She also showed a mild lip incompetency
and an open mouth posture while sleeping.

The diagnosis was Class II division 1 malocclusion with large
overbite and overjet (OB/OJ = 5.0/4.0 mm). She didn’t show
a noticeable facial asymmetry. Second molars were erupting.
Her profile was acceptable but showed a retrusive chin.
In model analysis, mild crowding (arch length discrepancy: Mx 4.0 mm, Mn 2.5 mm) and Curve of Spee (2.5 mm) were found. Bolton ratio was within normal range.

Because she did not want to use any additional appliance that required cooperation, the Forsus™ Appliance was chosen for her treatment.

**Treatment Progress**
a. Leveling and alignment
- .022” × .028” Clarity™ Ceramic Brackets, MBT™ System prescription were bonded
- .016” Ni-Ti wire
- .016”, .018” Australian wire
- .019” × .025” Ni-Ti wire (Figure 3)
- .019” × .025” TMA wire with reverse Curve of Spee on the lower arch
- #17, 27 bracket bonding, #16, 26 band with tube
- Upper .018” × .025” Ni-Ti wire
- .019” × .025” stainless steel wire with soldered hook

b. The Forsus Appliance
- Use the Forsus appliance until achieving the proper overbite and overjet (Figure 4A-C)

c. Finishing
- .019” × .025” stainless steel wire with steps

d. Retention
- Brackets were removed after bonding of fixed retainers (Figure 5A-P)

**Results Achieved**
Her overbite, overjet and incisor irregularities were corrected. In Figure 4A-C, you can see a fractured Forsus spring on the left side and it was repaired easily.

During treatment, temporary acceleration of mandibular growth and a small increase of nasal height made her profile better. Because I wanted to minimize the distalization of the upper arch, a full size rectangular stainless steel archwire was engaged including upper second molar during Forsus appliance treatment.

The Forsus appliance pushes the upper and lower dentition reciprocally. But many reports show that in fixed functional appliances, including Forsus appliances, the lower dentition tends to move more than the upper dentition.9,10

For those reasons, upper molars did not move distally as you can see in superimposition tracing. Arch expansion and small amount of stripping solved the upper arch crowding.

After debonding, an upper circumferential retainer and lower Hawley retainer were used full time for 6 months. After 1 year 5 months, overbite, overjet and molar relationship were stable (Figure 6A-I).

**4. Conclusion**
If you are not using the Forsus appliance in your practice, I recommend you to try this easy and reliable appliance. The Forsus appliance provides the compliance-free benefits to your daily practice and its easily reparable feature minimizes clinical problems during treatment.
References


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