

Why the Forsus™ Fatigue Resistant Device is My Treatment of Choice

by Nina Heinig, DDS



Dr. Nina Heinig received her dental degree from the University of Tübingen, Germany. She specialized in orthodontics with both university training and in a private orthodontic office. Since 2000 she has been in full-time practice of orthodontics in Wendlingen, Germany. Additionally, she lectures on prophylaxis and prophylaxis management.

Dr. Heinig was one of the first to use the Forsus™ Class II Corrector system as part of a research project in 1999. She now uses the system routinely and has gained a wealth of experience with this type of treatment.

Getting young patients with multiband appliances and Class II malocclusions to use their elastics is a hard job. According to a German study* as many as 29% of the patients follow their doctors' instructions to wear the elastics around the clock. Another 28% use them for at least 12 hours. This leaves 42% of all children who use their elastics either only at night, sometimes also during the day; or who use them rarely, or not at all.

Yet, we as orthodontists want a perfect outcome, and we want it fast and safe. Consequently, we utilize advanced self-ligating bracket systems, superelastic archwires, and fixed Class II correction appliances such as the Forsus™ Flat Spring and the Forsus™ Fatigue Resistant Device, which avoid those annoying elastics.

The Forsus™ appliance serves the needs of orthodontists

It is interesting to take a look at the history of the Forsus appliance. The Forsus Flat Spring (Fig. 1) made of Nitinol was being used as early as 1999. It is still available and, in some treatment instances, this design is preferred.

I have found the Forsus Fatigue Resistant Device with a coil spring to be comfortable for patients. A first version had a spring with a bypass design. Later this was changed to a direct push rod.

The latest improvement is even more exciting: the Forsus™ Fatigue Resistant Device EZ Module features a “click-into-place” clip (Fig. 2). In my opinion, 3M Unitek has succeeded in creating a “perfect” improvement. The mechanism facilitates the attachment of the coil at the headgear tube, although an occlusal headgear tube is required. The occlusal adjustment helps increase patient comfort and makes it easier to get used to the new appliance.

The Forsus appliance offers a wide variety of potential applications

While unilateral Class II malocclusion cases require one single Forsus appliance (Fig. 3-4), two are needed to mesialize the mandible in bilateral Class II cases (Fig. 5-7). For the treatment of asymmetrical cases, two springs of different lengths may be used on the right and left sides. In anticipation of some degree of relapse at the end of treatment, it is recommended to always overcorrect the malocclusion until an anterior edge-to-edge bite is achieved.

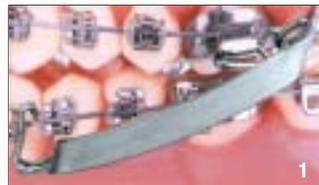


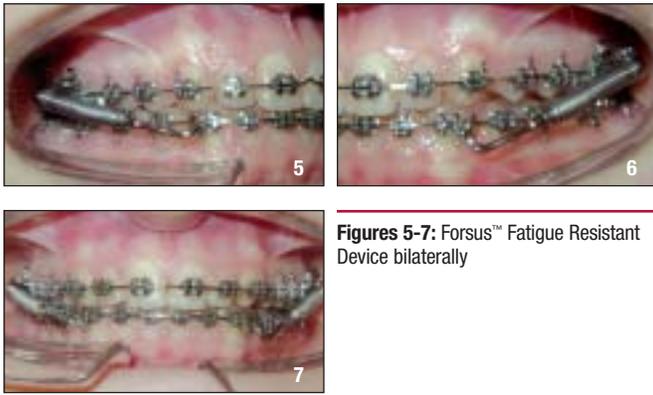
Figure 1: Forsus™ Flat Spring



Figure 2: Forsus™ Fatigue Resistant Device EZ Module clip assembly



Figures 3-4: Forsus™ Flat Spring unilaterally



Figures 5-7: Forsus™ Fatigue Resistant Device bilaterally

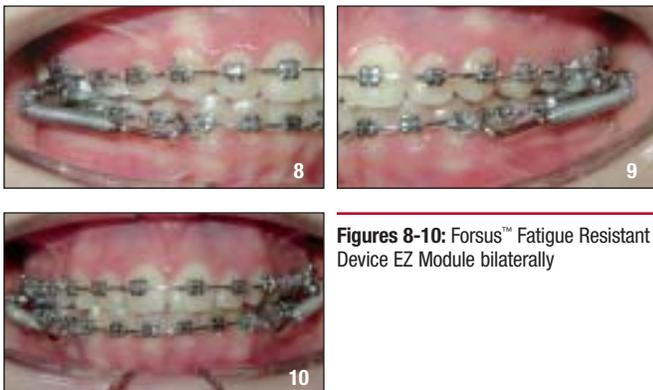
There are other clever ways to use Forsus springs. In patients with severely proclined maxillary anteriors, or those with completed skeletal growth, the appliance can be used leaving some length distally on the upper archwire before cinching it back, or without cinch-back of the archwire. The headgear effect produces a distalization of the upper molars. Then the Forsus spring remains passive to safely guide the bicuspid and, eventually, the anteriors into the distal direction. This procedure provides an alternative to extraction, orthognathic surgery, or even to the miniscrews that are currently popular.

The same procedure can be applied for patients with extreme lingual inclination of the lower anteriors or to move the lower teeth mesially, e.g. in patients with congenitally missing teeth.

Attaching the Forsus™ appliance is quick and easy

Traditionally, it was recommended to remove the first bicuspid brackets. This often resulted in extruded and rotated teeth, the alignment of which was a tedious procedure extending the overall treatment time. Today the Forsus spring is directly attached to the lower full archwire without prior removal of brackets. This is quick and easy.

Placement of the Forsus spring is a breeze – it takes just a few minutes and can be done as part of the follow-up appointments (Fig. 8-10).



Figures 8-10: Forsus™ Fatigue Resistant Device EZ Module bilaterally

Of course, the device should also be easy to remove. There is a simple and effective trick for the push rod used with the Forsus Fatigue Resistant Device: holding the end of the loop with a plier creates a long lever arm which allows the eye to be opened with finger force.

Hardly any problems; rarely any repairs! But some useful tips.

The most relevant undesirable effect of using a Forsus spring is protrusion of the lower anteriors. However, this can be prevented.

It is recommended to use a .021x.025" stainless steel wire with .022" slots. The archwires must be cinched back. Additional splinting or elastic chains from the terminal molar tooth on the right side to its contralateral counterpart may be helpful.

Sectional wires also remain an option. They require a bit more chair time, but are worth the extra effort as they create a vertical force vector which reduces the protrusion of the lower anteriors.

Very rarely, the push of the spring against the cuspid bracket may cause a loose bracket. A Gurin lock screw, attached to the archwire behind the bracket will act as a stop and may prevent this. Alternatively, an elastic chain can be tied from the loop of the push rod to the hook of the lower molar band. This short tether will limit the freedom of movement in mesial direction. In fact, I have seen only one cuspid bracket come loose in my office.

When placing the spring, the orthodontist should show the patient how the two component parts of the spring can be put together. Thus, should the two components come apart, e.g. because the patient has opened the mouth too far, he would be able to put the components back together without having to see the orthodontist.

Trauma may be prevented by avoiding excessive compression of the spring. If the push rod is visible at the upper end of the coil spring, it is advisable to use a shorter one.

Sometimes two small bends at the push rod may increase patient comfort considerably as this allows the spring to rest in the buccal fold more comfortably (Fig. 11).



Figure 11: Direct Push Rod with and without bend for patient comfort

Breakage is extremely rare and if it occurs at all it is the spring component that will break. The patient will not notice it, as the tongue or cheek should not be injured. Should this happen, simply replace the spring.

Patients and their parents appreciate the Forsus™ Spring

The effectiveness of using elastics to correct Class II is dependent in part on the patient's ability to install them correctly. Unfortunately, the average patient ties the elastics rather poorly. It takes manual skill and patience to attach the delicate rubber rings to the tiny hooks. As a result, patients find it to be a nuisance to be required to install these elastics on a regular basis.

Patients with Forsus correctors can be bothered initially by the presence of the appliance in their mouths, but they soon come to appreciate the effectiveness in terms of its low-maintenance nature and their perception that the fixed appliance may be removed sooner.

Patients can check in the mirror that the springs, though they may feel bulky, do not cause any visible bulging of the cheeks. Unlike one-piece Class II correctors, the Forsus appliance does not limit the patient's ability to move the jaw – they may even yawn vigorously. This means real patient comfort.

Parents also appreciate an efficient treatment. It is a relief for them if they do not have to constantly remind their children to tie the elastics. Moreover, the unsavory procedure of detaching and reattaching the elastics before and after meals is eliminated.

The two-component Forsus corrector system has obvious advantages over one-piece systems

A common problem with one-piece appliances for Class II correction is that they do not allow a patient to open their mouth very far, for example when yawning, since this might result in breakage of the appliance. Fortunately, though, this is not the case with the Forsus Fatigue Resistant Device, as it consists of two separate components that are put together like a telescope. If the patient opens too far, the components simply come apart. Most patients can easily put the upper and the lower parts back together. This may not only save additional appointments but also renders reinstallation of springs unnecessary, as well as reduces chairtime and possibly the total duration of treatment.

At each appointment, the two-component device enables the orthodontist to easily assess the correction achieved. To do this, the spring is disconnected from the rod and the patient is asked to bite with the mandible far distally (Fig. 12-13). The two individual components should be placed in the buccal fold so they do not interfere with the occlusion. Then the two parts are put back together.



Figures 12-13: Quick test to assess mesialization of the mandible

This is a quick test that renders useful information about the current status of treatment and whether activating the spring is necessary. Unlike one-piece systems, complicated disassembly is not necessary. Additionally, this demonstration improves patient motivation.

There are several ways of activating the spring

A Forsus spring remains in place for 3 to 5 months depending on the baseline situation and the biological response. Springs can be re-activated during regular checkups until the desired result is achieved. Reactivation can be attained in different ways. First, by reducing the amount of pin play inside the headgear tube. Second, by attaching a Gurin lock at the distal side of the lower canine bracket, if necessary at some distance. And third, by crimping a stop onto the push rod. The various options allow the orthodontist an individual treatment for each case. A combination of one or several of these options is possible.

Usually, no additional, heavier forces are required. Only in very severe Class II malocclusions should a longer push rod be placed after a couple of months. In this case the coil spring does not need to be replaced. This will save chairtime, treatment cost, and personal effort.

The Forsus spring is my treatment of choice. "FOR'S'US" is FOR US. ■

*F. Exarchou, G. Göz. Results of an Anonymous Survey about Compliance During Treatment with Fixed Orthodontic Appliance. Abstract of the University of Tübingen at the Scientific Annual Meeting of the German Orthodontic Society 2004 in Freiburg, page 33.