

The Universal Bite Jumper

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Over the past few years, the Herbst appliance has experienced a considerable rise in popularity, since it enables the correction of Class II malocclusions without the need for patient cooperation.¹⁻⁷ The correction is achieved by both dentoalveolar adaptation and, in growing patients, by mandibular growth stimulation.⁴

The Herbst can reduce the length of treatment when its orthopedic action is combined with the dental movement provided by fixed appliances. Many clinicians have developed variations on the original Herbst,⁸⁻¹³ and other appliances for mandibular propulsion have also been developed.¹⁴⁻¹⁸

The Universal Bite Jumper, introduced in this article, can be used in all phases of treatment, in the mixed or permanent dentition, and with removable or fixed appliances (Fig. 1). Like other mandibular propulsion appliances, the UBJ uses a telescoping mechanism; an active coil spring can be added if necessary. The UBJ can also be used in Class III cases if mounted in a reverse configuration.

Fixed Appliance Configuration

In its normal configuration, the UBJ is attached to the maxillary headgear tube with a ball pin (Fig. 2). This pin is bent so it can be tied with a ligature wire to the hook on the molar band. A transpalatal arch or expander can be used to control palatal width.

In the mandibular arch, the sliding rod ends in a 90° hook that is fixed to the archwire. The premolars should be left free, while .022" brackets are bonded from canine to canine. The .021" X .025" mandibular stainless steel archwire should have a stop and a buccal offset to allow clearance for sliding, and should be bent tightly back distal to the mandibular molar tube. A 10-15° coronolingual torque should be placed in the wire to immobilize the incisors.

The UBJ can also be attached to an auxiliary sliding archwire, which is fixed in two places to the main arch (Fig. 3).

No laboratory preparation is required; the UBJ is fitted in the patient's mouth and cut to the appropriate length for the desired mandibular advancement. To avoid any risk of breakage, I recommend using either stainless steel crowns or photoetched bands.⁴

Lower Cantilever Configuration

In an alternative configuration, the loop on the rod is fixed to a lower cantilever, consisting of a 2.4mm X 1.4mm oval Rumanium wire with a welded ball clasp, from the mandibular molar crown to the interproximal area between the mandibular first bicuspid and cuspid (Fig. 4). An .048" welded lingual arch links the two mandibular molars and contacts the lingual surfaces of the mandibular incisors. An .028" tube adjacent to the cantilever allows positioning of the mandibular incisor realignment archwire.

Separators are placed on the molars several days before the impression appointment. At this visit, impressions are taken for working casts, and a wax bite is taken with the desired mandibular

advancement. If photoetched bands are used, the impression should be taken with the bands in the mouth; if molar crowns are preferred, they can be fitted and adjusted on the cast, which is then trimmed around the first molars.

The UBJ tubes are welded to the maxillary molar bands or crowns. The lower cantilever and lingual arch are prepared and welded. Articulator mounting in the laboratory will facilitate construction of the UBJ, which is set to the required mandibular advancement by cutting the tubes and rods to the proper length.

Fitting is done at the second appointment. The bands or crowns are tried on, then bonded with glass ionomer cement. The UBJs are adjusted while mandibular movements are checked. Depending on the case, the brackets can be bonded during the same visit or a few weeks later. The advantage of this configuration is the possibility of immediate orthopedic action without waiting for dental alignment.

Removable Splint Mounting

When used with removable acrylic splints, two lateral UBJs link the maxillary molar areas and the mandibular first premolar areas. They are attached to 1.2mm ball clasps, which are constructed on the working cast and then incorporated into the thermoformed splints¹⁹⁻²¹ (Fig. 5). The lower loop of the UBJ should be oriented in an anteroposterior direction.

A single median UBJ can be used to link the removable splint from the middle rear area of the palate to the lingual surface of the mandibular incisor (Fig. 6). This UBJ is attached to two transverse axles, which allow opening and lateral movements. The median UBJ provides muscular therapy, because it prevents the tip of the tongue from contacting the lower lip. It also makes it easier to add headgear tubes to the splint. Most children are able to speak well with this appliance in place, given a little time to adjust. Any possibility of cheek impingement is eliminated, and experience has shown that the tongue is not irritated by the UBJ.¹⁷

Class III cases can be treated by mounting lateral UBJs with nickel titanium coil springs on removable splints. In such cases, the UBJs are reversed so that the maxillary canine region is attached to the mandibular molar region (Fig. 7).

Adjustments

The UBJ is generally set to obtain one-half to two-thirds maximum mandibular advancement. Reactivations are made every six to eight weeks by crimping 2-4mm splint bushings onto the rods (Fig. 8). UBJs with nickel titanium coil springs do not need to be reactivated (Fig. 9). Midline or asymmetrical problems can easily be treated by adjusting one side or the other of the appliance.

Case Reports

Case 1 was a brachyfacial Class II patient with a 9mm overjet and anterior overbite (Fig. 10). A UBJ and lower cantilever enabled correction of the malocclusion and improvement in the facial profile in 21 months (Fig. 11).

Case 2 was a 12-year-old boy with a similar pretreatment condition (Fig. 12). A median UBJ on removable splints and a headgear were worn for 10 months. This orthopedic phase produced an overcorrected edge-to-edge occlusion. The case was then finished with 14 months of fixed appliance therapy (Fig. 13).

Case 3 was a Class III patient in the mixed dentition with an anterior crossbite (Fig. 14). A reverse UBJ with nickel titanium coil springs (Fig. 15) produced a correction within five weeks (Fig. 16).

Conclusion

The UBJ offers the following advantages:

- It is simple, sturdy, and inexpensive.
- Inventory requirements are minimal—the UBJ can be used on either side of the mouth, and there is only one size, since it is cut to the desired length for each case.
- It can be used at any stage of treatment—in the early mixed dentition to obtain an immediate mandibular advancement before any dental alignment, or in the permanent dentition for fixed-functional treatment.
- It can be used in Class II or Class III cases.
- Its low profile results in considerably less buccal irritation than with similar appliances.
- Patient comfort and acceptance are excellent.
- It can easily be attached to removable splints for maximum anchorage.
- It produces good results without the need for patient cooperation.

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FIGURES

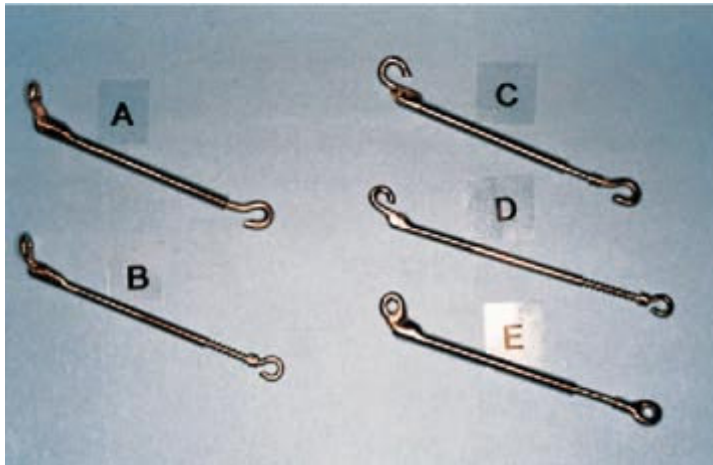


Fig. 1 A. Universal Bite Jumper for fixed appliances. B. UBJ for fixed appliances with nickel titanium coil spring. C. Lateral UBJ for removable splints (Class II treatment). D. Lateral UBJ with coil spring for removable splints (Class III treatment). E. Median UBJ for removable splints (Class II treatment).



Fig. 2 UBJ attached to fixed appliance.



Fig. 3 UBJ attached to auxiliary archwire.



Fig. 4 UBJ attached to lower cantilever.



Fig. 5 Lateral UBJ attached to removable splints.

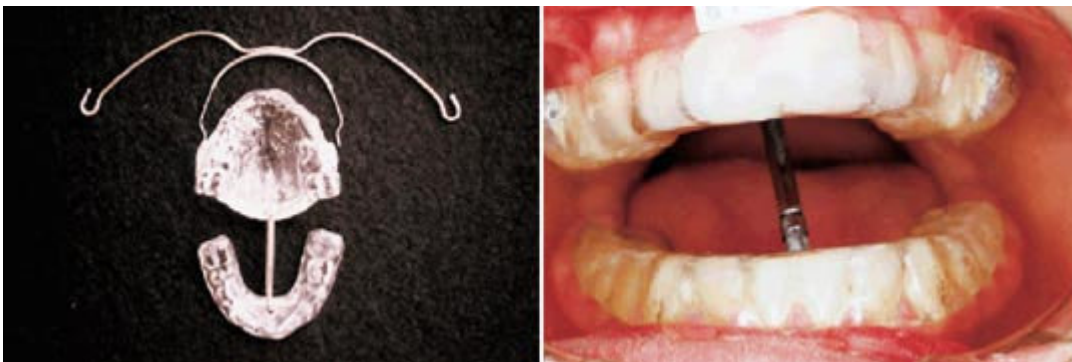


Fig. 6 Median UBJ attached to removable splints.

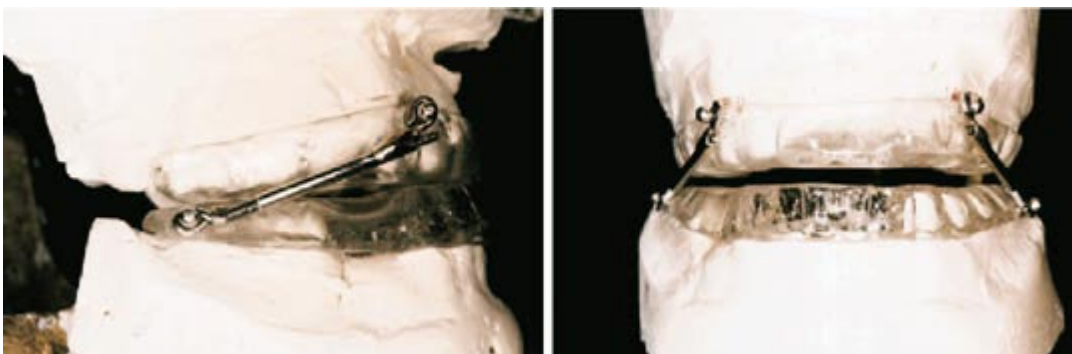


Fig. 7 Two lateral UBJs with nickel titanium coil springs for Class III treatment.

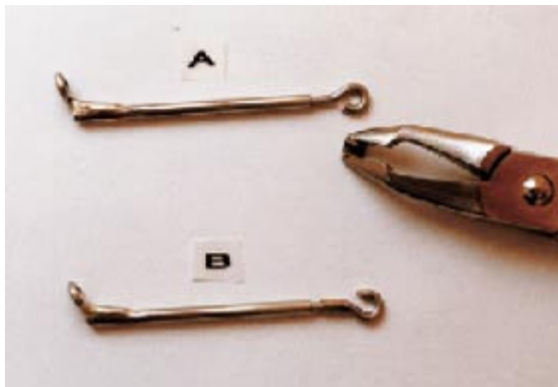


Fig. 8 Reactivation by adding splint bushing.



Fig. 9 UBJ with coil spring attached to fixed appliance.

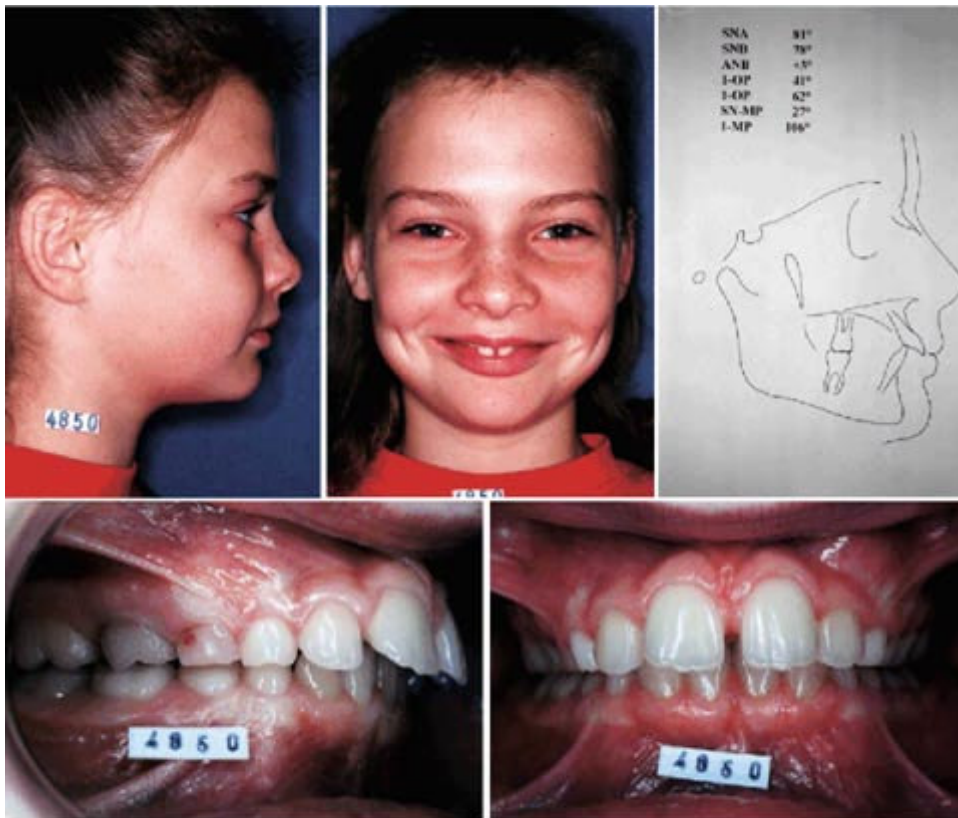


Fig. 10 Case 1. Class II patient before treatment.

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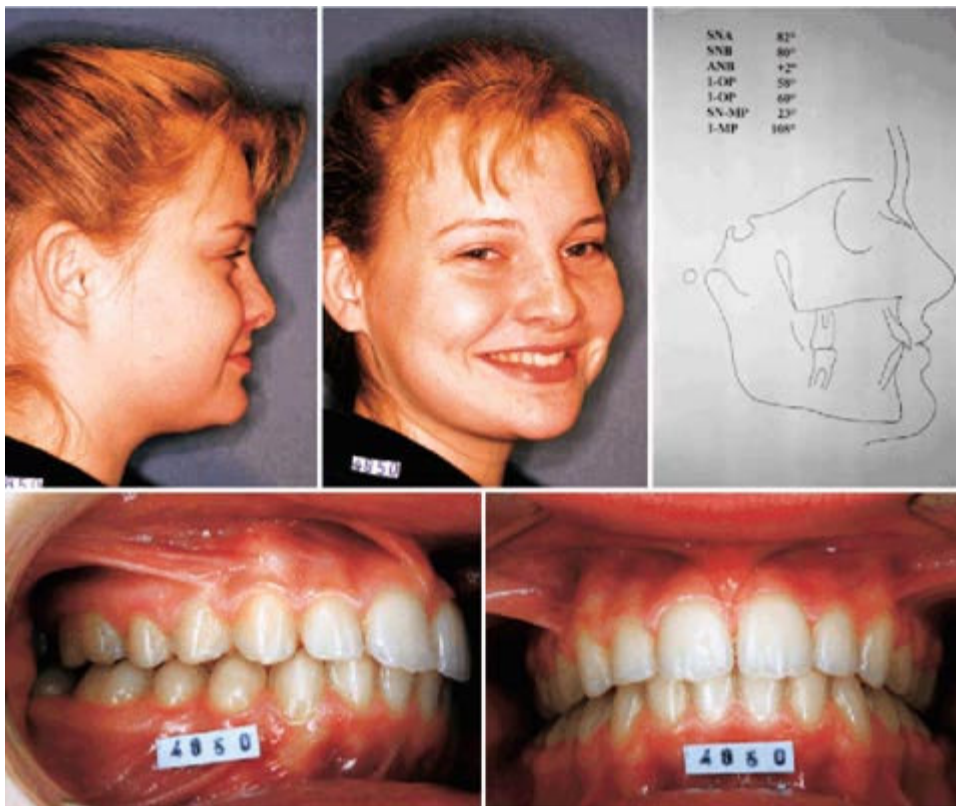


Fig. 11 Case 1. After treatment with UBJ and lower cantilever.

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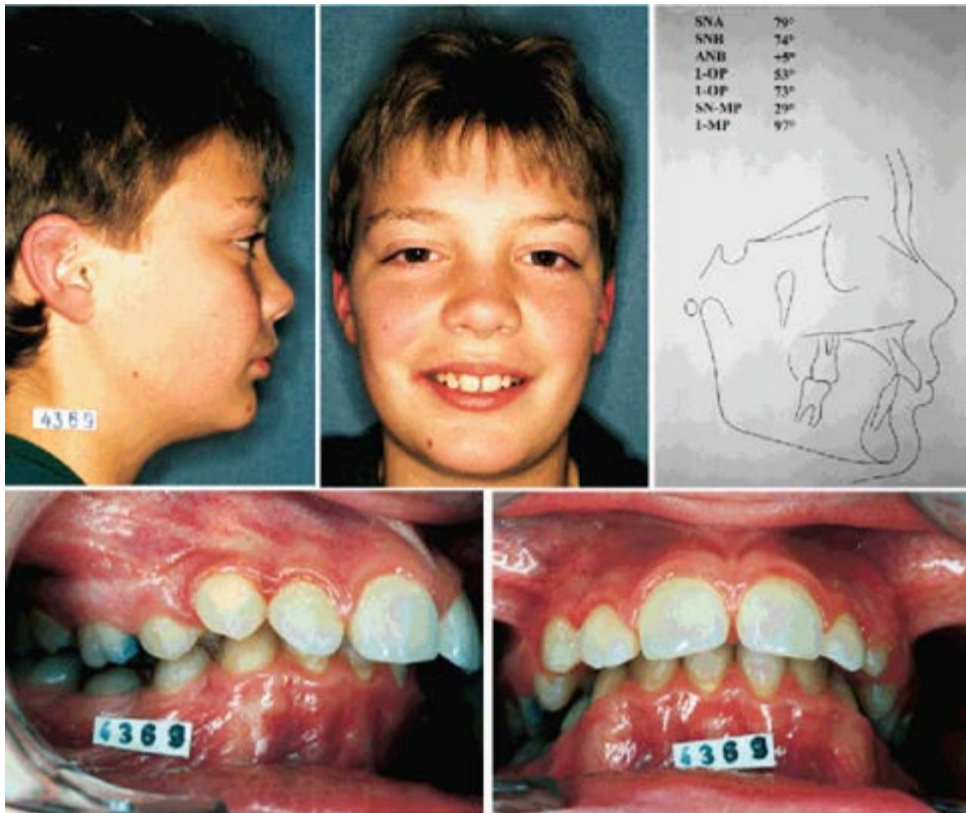


Fig. 12 Case 2. Class II patient before treatment.

Fig. 12 Case 1. Class II patient before treatment.

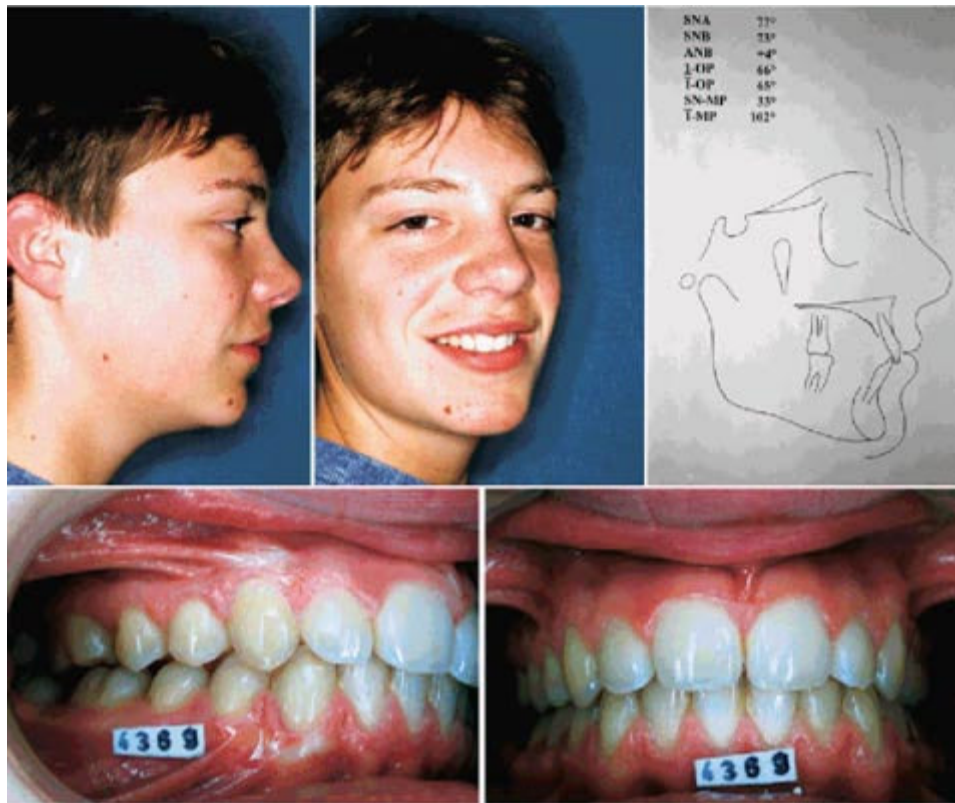


Fig. 13 Case 2. After treatment with median UBJ, splints, and headgear.

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Fig. 14 Case 3. Class III patient before treatment.

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Fig. 15 Case 3. Reverse UBJ and removable splints.

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Fig. 16 Case 3. After treatment.

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FOOTNOTES

1 Herbst, Rumanium wire, registered trademarks of Dentaaurum, Inc., 10 Pheasant Run, Newtown, PA 18940.

2 Photoetched bands, American Orthodontics, 1714 Cambridge Ave., Sheboygan, WI 53082.