DISTAL JET ENHANCED

by William (Bill) C. Machata, DDS

For more than six years I’ve watched the continual growth of the Distal Jet as the major distractor of choice in many offices and gathered invaluable information about the appliance. My ongoing contacts and access to relevant information, including feedback from clinicians, have become international in scope. The inventors of the Distal Jet appliance — a clinical orthodontist and a certified orthodontic lab technician — have also added immeasurably to my knowledge and understanding of both the philosophical and technical underpinnings of all jet appliances. This long-standing involvement with the project kept me focused on redesigning key appliance components and evaluating several clinical management protocols.

Over time the practitioner clinicians relating clinical experiences with the Distal Jet have brought a common chorus of concerns, which were (1) the nagging frustration of not being able to adequately and easily visualize access to the screw head, (2) the frequent stripping of the parts (set screw, lock and activation wench), and (3) the sometimes questionable activation issues (which screw and when). These concerns prompted us to design the new lock and screw mechanism. This new mechanism is a one-piece MIM cast part that combines an elongated horizontal section for spring compression with a vertical section that houses the locking screw. This configuration addresses the reported concerns and suggestions and provides key advantages over the original design (Figure 1).

ADVANTAGES OF THE NEW DESIGN

• The single-screw design (one set screw on each side) eliminates the uncertainty of which screw to tighten and when to tighten it.
• The increased screw-head size greatly increases visualization and access and minimizes the potential for stripping the parts.
• The substantially reduced size of the overall configuration of the new locking mechanism presents a much smoother, less bulky profile for increased patient comfort and hygiene as well as facilitating appliance construction.
• The long horizontal section acts to guide and support the bayonet wire during the distalization process, providing more precise molar control.
• The orientation of the new locking mechanism advantageously positions the locking screw to the anterior, and the vertical section lifts the screw head to the occlusal. Both features further enhance visualization and access.

TREATMENT PROTOCOLS

Analysis of many case reports and shared clinical observations has been extremely helpful in developing a set of treatment protocols and clinical management strategies. Although anecdotal in nature, they have provided valuable insight into what seems to work better clinically. The following tips are suggestions that should be guidelines to facilitate handling the Distal Jet while optimizing its efficiency and effectiveness.

TIP #1 – Correct molar rotations before distalization. Molars whose rotations are corrected and roots properly oriented and positioned in bone before being distalized translate better with minimal or no untoward effects. You can accomplish this easily by using the design features built into the Distal Jet. Before the appliance is constructed, review and mark the patient’s working model for rotational corrections where indicated. The lab-fabricates the bayonet with correction bends incorporated in the double-back section that inserts into the lingual sheath. In this way, the Distal Jet functions like a transpalatal bar (TPB), effecting the required rotational correction while maintaining full control of the molars in three planes of space. The lab-pre-activates the appliance but, in this instance, do not remove the stabilizing wire after cementation. Check the progress at the next appointment. After molar rotations are corrected (usually four weeks), remove the stabilizing wire to initiate distalization automatically (Figure 2).

TIP #2 – Whenever possible, use the first bicuspids as the anchor teeth. There are distinct advantages of using the first rather than the second bicuspids.
• The first bicuspids benefit from the natural distal drift (distoidontics) that accompanies molar distalization, eliminating their need for active retraction and anchorage; however, if the space doesn’t close completely on its own, use light Class II mechanics to finish.

TIP #3 – For patient comfort, place a large elastic separator around the bayonet sheath interface to create a soft cushion around the areas filling any voids between the parts and smoothing any sharp corners. It also adds additional security to the connection of these parts. Check and replace the separators at each appointment.

TIP #4 – When using the activation wrench, maintain a slight downward pressure in the recess of the screw head before loosening or tightening the screw and make sure it’s completely seated to minimize stripping out the parts.

TIP #5 – Do not overtighten the screw during molar distalization. Overtightening can make the Distal Jet susceptible and if the wrench is not seated completely, it can lead to stripping the parts. Tighten the screw just sufficiently enough to hold the lock in position and maintain spring compression.

TIP #6 – To convert the Distal Jet into a more efficient appliance to a molar retainer after distalization (Figure 3), tighten the screw into the lock as completely as possible. This will deform the tube of the bayonet director against the bayonet and create a rigid connection among all three components — bayonet, tube and lock. The objective at this time of the retention period is to stabilize the molars and allow the bone to reorganize around their roots.

CONCLUSION

The purpose of introducing change in any established, accepted device can have only one rationale: simplification and/or improved efficiency and effectiveness of an appliance and its clinical application. With these new enhancements, the diameters of the three independent components (lock, spring, and stop) that comprise the force delivery unit of the appliance have been coordinated to transition seamlessly and smoothly from one component to the other. The net effect is a uniform, clean and compact unit that further enhances the functional capability of the appliance.

Figure 1. With only one screw instead of two and the increased screw-head size, this new design makes intraoral access much easier.

Figure 2. Newly enhanced Distal Jet activated for molar distalization.

Figure 3. Distal Jet converted into a Mance molar holding appliance.
Over the years there has been a lot of interest in anterior displacement of temporomandibular joint discs.1-3 In this condition, the disc is usually anterior and medial or lateral to its normal position with respect to the mandibular condyle, and the medial and lateral ligaments that attach the disc to the condyle are usually stretched or ruptured and thus allow independent disc movement. As the mandible translates and rotates in the opening movement, the anterior dislocation may be reduced as the condyle slips onto the disc, causing a clicking noise at the joint. Patients with this condition often complain of pain and discomfort and require treatment.

**TWENTY-PATIENT STUDY**

To study the effectiveness of the removable acrylic splint Herbst therapy, I selected 20 consecutive adult patients that I successfully treated with a splint Herbst appliance. Of these 20, there were 15 females and 5 males; 14 were 25 years of age or older, and with an age range from 18 to 39, the mean age was 29.8 years. Following splint Herbst therapy, all patients wore a superior repositioning splint to allow mandibular seating superiorly on the posterior slope of the eminence. These appliances were worn and adjusted until the mandible was stable and no longer changing position. This technique also determined the success or failure of repositioning therapy. If the disc dislocated when the patient was placed on the superior repositioning splint following the splint Herbst therapy and the patient returned to a painful state, treatment would have been considered unsuccessful and the patient would have been offered the choice of arthroplasty or returning to anterior repositioning using the Herbst. The average treatment time with the splint Herbst was 8.1 months with a range of 5 to 12 months. After following the subjects from 16 to 36 months after superior repositioning splint therapy, I found that all remained stable.

**METHOD OF MEASUREMENTS**

I assessed the effects of the splint Herbst appliance on facial morphology with the following measurements on pre- and posttreatment lateral cephalograms (Figure 2).

- **Articulare-pogonion** – measured in millimeters.
- **Posterior facial height** – measured as a perpendicular from Frankfort horizontal to gonion. (A mandibular tracing was made and used on pre- and post-radiographs in order to standardize landmark identification.)
- **Anterior facial height** – measured from ANS to naris in millimeters.

**MEASUREMENT RESULTS**

Nineteen patients showed no change in the lower incisor-mandibular plane angle and one patient displayed a proclination of 3°. There was no change in maxillary incisors. The patients’ pre- and posttreatment lateral cephalograms measurements were as follows:

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Average Increase</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articulare-Pogonion</td>
<td>2.1 mm</td>
<td>1.4 mm</td>
<td>0.0 to 5.0 mm</td>
</tr>
<tr>
<td>Posterior Facial Height</td>
<td>1.6 mm</td>
<td>1.1 mm</td>
<td>0.0 to 4.0 mm</td>
</tr>
<tr>
<td>Anterior Facial Height</td>
<td>1.7 mm</td>
<td>1.6 mm</td>
<td>0.0 to +5.0 mm</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The old axiom that mandibular length cannot be altered following the cessation of growth is not supported by this study since there was an average increase of 2.1 mm in articulare-pogonion. However, it must be remembered that all the subjects of this study had some degree of temporomandibular joint disc displacement.

**REFERENCES**

Get It Right

“TAKE IT” AND GET IT RIGHT...EVERY TIME!

Take 1 Monophase Fast Set from Kerr can provide you with accurate, dependable impressions for your Red, White and Blue and indirect bonding patients.

• DETAIL EVEN IN THE PRESENCE OF MOISTURE
While most polyvinyl materials use a single hydrophilic additive, Take 1 combines its proven surfactant with a patented hydrophilic monomer that results in unsurpassed detail.

• A PERFECT FIT FOR YOUR PATIENTS
The unique chemistry of Take 1 – a blend of 5 vinyl polymers and bimodal filler – means improved elongation and tear strength that provide accurate results.

• NO PATIENT OR PARENT COMPLIANCE
The lower Spring Jet is patient friendly because of its compact size and consistent force delivery. Adjuncts such as bondable rests can be added easily. With high placement, excessive tongue irritation is avoided.

• DIMENSIONAL STABILITY YOU CAN’T GET WITH ALCANITE
Even if you don’t pour the model immediately, the excellent quality of the impressions remains the same for days.

• EASY-TO-READ
Fabricated in a bright color.

If you use Take 1 for your impressions, just ship them directly to AOA/Pro and we’ll pour the models for you at no charge!

Call us at (800) 262-5221 for information about Take 1 or visit www.kerrdental.com for details.

The Spring Jet for Fixed Slow Expansion

• No Patient or Parent Compliance Necessary
• An Economical Choice
• Easily Placed and Activated
• New Easy-to-Adjust Lock Mechanism
• Used for Adult and Mixed Dentition Treatment
• Variable Design Possibilities Using 240 gm or 400 gm NiTi Springs

The lower Spring Jet is patient friendly because of its compact size and consistent force delivery. Adjuncts such as bondable rests can be added easily. With high placement, excessive tongue irritation is avoided.

The Upper Spring Jet has a telescopic unit that is placed high in the palate, about 5 mm up from the center of the molar bands, so that the line of force passes close to the center of resistance of the teeth.

The popular DeLuke Contourled Expander is also available with either the Spring jet 1 or II (double system).

Visit www.ormco.com/aoa to view Dr. Laurie Fricke’s Clinical Impressions article, The Case of Two Sisters – Correcting Transverse Discrepancies, Vol. 10, No. 8, 2001. For a reprint of Dr. Aldo Carano and Mr. Mauro Testa’s JCO article, The Spring Jet for Slow Palatal Expansion, Vol. XXXIII, No 9, 1999, call AOA/Pro at (800) 262-5221 or (262) 886-1050 or call the Enfield, Connecticut, facility at (800) 826-2224 or (860) 741-3745.

Where in the World are Max & Paula

Paula and Max are always delighted to meet with you and your staff whenever possible. They are also available for presentations on a variety of laboratory and clinical topics for study club, alumni and society meetings. Give them a call to discuss a presentation or contact your Ormco representative to schedule a time to meet while they are visiting your area.

For additional event and course information, visit www.ormco.com/aoa.

AOA/PRO CUSTOMER SERVICE LINE (800) 262-5221