by Drs. Terry and Bill Dischinger

“You plan on putting that in my child’s mouth?” How many of us have heard that over the years when showing the patient and parents a Herbst appliance? Or maybe, we were just waiting to hear that. Comfort was our goal when we began designing the AdvanSync Molar to Molar Class II Corrector more than seven years ago.

We knew that with the advantages a telescope Herbst provided, we could continue to make the appliance smaller and smaller. We felt if we could incorporate four pieces to the mechanism, it would allow us to make the appliance so small, it would only need to be attached to the molars. That is where the original name of Molar to Molar Corrector came from. While designing and testing the appliance, we realized that there were so many other advantages we had not even initially considered.

One of the many advantages of the AdvanSync Molar to Molar Class II Corrector is that it has allowed us to orthopedically correct the Class II while simultaneously doing all the orthodontics with the braces, saving at least six months of treatment time. The appliance is attached just to the molars in contrast to previous Herbst designs that were either attached to the mandibular first premolars or had a long cantilever arm making it impossible to place braces on the mandibular premolars. This problem is eliminated by the new design and we are now able to bond both the maxillary and mandibular arches from second premolar to second premolar (upper and lower 5-5). Doing this allows us to perform all the orthodontics while the AdvanSync is in place. When the AdvanSync is removed, the orthodontic work is virtually done, leading to a much shorter treatment time. Most cases in our office are being treated in 14-18 months, saving us well over six months from our traditional Herbst treatments.

Case Presentation

When the patient returns to the office for her new start appointment, the spacers are removed (Fig. 1), and the AdvanSync crowns are fit one at a time similar to fitting bands. The screws are dipped in Ceka bond prior to their insertion. The mechanism is attached to the maxillary crowns. Use a small quarter-inch, 2 oz. elastic to tie the mechanism to the axel. This will help keep the arm out of the way while cementing it. Once the crowns have all been fit, they are set aside.

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We now bond maxillary and mandibular second premolar to second premolar (5-5). Either direct or indirect bonding methods will work. We have used both methods. We have found that in order to level the lower arch and correct the overbite, the premolars need to be bonded very gingival just as you would with any Class II case with a deep overbite. In the mixed dentition crowns are placed on the second primary molars, if two-thirds of the root is present. This prevents impingement on the ascending ramus. We have used crowns on the second primary molars for many years with the Herbst appliance. In the mixed dentition brackets are placed on the incisors and the primary canines. In some cases, the primary first molars are bonded as well to help in securing the wire in place in the span from the primary canine back to the crown. The treatment protocol is essentially the same for both mixed and permanent dentition cases.

Following the bonding, we then cement the AdvanSync crowns one at a time. Once the crowns are cemented, we figure-eight-lace the maxillary 6-6 full arch. This is key to the treatment. A Herbst appliance will distalize maxillary molars. We don’t want that to occur. If the molars distalize, the orthopedic effect on the mandible is lost. We lace every single patient this way, even patients that we might be using open coil springs with, to create arch length in the presence of crowding. We are frequently asked how we are able to gain space yet have the whole arch laced together. We believe the light ligature wire has enough give to it that the arch is able to broaden yet hold the molars in place. It has worked routinely for us for more than five years.

We then place .014 CuNiTi wires in both the maxillary and mandibular arches. These wires go 6-6, through the tubes on the molar crowns. The upper wire is cut flush. The lower wire is annealed and bent up. If springs are being used, do not bend the lower wire tight with the end of the archwire tube. We almost always use springs to gain all the space before engaging crowded teeth on the .014 wires. This allows maximum arch development and prevents the dumping of mandibular incisors labially. We have found that an .016x.022 SS overlay archwire is very useful and aiding in the leveling of the lower arch. Many times we will just solder an 022.x.028 archwire tube alongside the existing tube on the lower molar crowns so that both wires can be inserted 6-6. If it is not possible to solder a tube, then we have run the .014 wire 5-5, and then the .016x.022 SS overlay is run 6-6 into the archwire tubes. Once the wires are placed, the arm mechanisms are attached to the lower crowns with screws that have been dipped in Ceka bond. The initial activation will place the patient into a Class I canine position.

Once the AdvanSync arm mechanisms have been attached, the patient needs to be checked to ensure that the midlines coincide. If they are not aligned, then shims need to be placed on the side that the mandibular midline is deviated until the mandibular midline is centered under the maxillary midline. If this is difficult to achieve, they can be closely approximated, then centered at the following appointment. Some midlines will be off-center due to crowding or rotated teeth. In Class II cases, research shows that 50 percent have a skeletal midline asymmetry.

At the new start appointment we fit the AdvanSync crowns, bracket the teeth, place the upper figure-eight lacing in the maxillary arch, place the archwires, and connect the AdvanSync mechanism (Fig. 2). If you will notice in most cases, the patients profile looks normal after the insertion appointment. This is a very positive happening for the parents and patients.

We tell our patients that they will have trouble eating for about five days. Most patients will initially have a posterior open bite due to the
activation. This is similar to a patient with bite turbos. With the crowns on the molars though, they typically are able to start eating sooner than patients with bite turbos.

We see patients with open coil springs being used to gain space six weeks after the initial placement to either reactivate the springs, or engage the initially blocked out teeth. If no open coil springs are being used, we see them 12 weeks after the initial placement. At the 12-week appointment, the wires are typically changed to .014x.025 CuNiTi. The upper arch figure-eight lacing is maintained. In addition, a surgical tie-back hook is placed mesial to the upper first molar and steel ligature tied to the hook on the molar crown, this provides double protection to prevent the molars from distalizing. The AdvanSync appliance is activated 4mm on each side using the activation shims from the AdvanSync kit.

Some patients will be in their final overcorrected position at this point (Fig. 3). Our overcorrected position places the maxillary canine end-on with the mandibular first premolar when the initial cuspid relationship is end-on or less. In severe Class IIs greater than end-on or in adult cases, we overcorrect a full tooth, placing the canines in a full Class III position. As mentioned earlier, 50 percent of all Class IIs have a mandibular skeletal asymmetry. If the mandibular midline was deviated initially, then it needs to be overcorrected. We incorporate the same philosophy as the overcorrected cuspid relationship to correct asymmetries. As a guideline, we overcorrect the midline by placing the mandibular midline half the width of a maxillary central incisor over. However, the initial canine relationship still needs to be checked. The more severe the initial Class II relationship, the more severe the discrepancy of the midline, the more overcorrection that is needed. In almost 30 years of using the appliance at Dischinger Orthodontics, there has never been a patient not drop back. We tell the patients and parents it will take two to six months for the jaw to drop into position. The mandibular arch needs to be leveled to allow the normal rebound of the mandibular over correction. They are also told that if we do not overcorrect prior to the AdvanSync being removed, that as the jaw drops back, the overjet will return.

If at this activation the patient was not placed into their final overcorrected position, then they are seen back 12 weeks later and activated into the final position. We typically will increase the wire dimensions again by placing either a .019x.025TMA or a .019x.025 NiTi with 20 degrees of labial crown torque for the incisors in the maxillary arch, and a .016x.025 stainless steel in the lower arch. Patients are held in the final overcorrected position for 12 weeks and then a joint film is taken of the TM joint to confirm the condyle is centered in the fossa. If it is centered, then the AdvanSync appliance and crowns are removed a week later. If the condyle is not centered, we then have them return in six weeks to take another joint film. Just about all growing patients are centered after three months over correction; definitely centered after four-and-a-half months. If you do not have the capability to take joint films, we recommend holding patients in the final position for 18 weeks, and for adults, 24 weeks, to ensure that they are completely centered.

At this time in our practice the rectangular wires in the previous paragraph would have been placed (Fig. 4). Also, the patient would be over corrected more into a Class III dental relationship.

Figure 5 shows the patient the day the AdvanSync was removed. Notice the mandibular arch was not leveled as would be preferred. Notice the great position of the molars after the AdvanSync was removed (Fig. 5).
The appliance is removed by cutting the crowns at all four corners on the occlusal surface just over the occlusal table and the buccal-mesial corner cut down the line angle taken all the way subgingival, completely cutting the crown (Fig. 6). The crowns are then removed with a crown-removing plier. The adhesive is cleaned up and the wires are sectioned 5:5. We do not bond the molars at this appointment as the tissue is usually irritated and isolation is difficult. We have the patients return a week later and the molars are bonded and the case proceeds with normal orthodontic mechanics to finish. The mandible typically takes two to six months to relapse into Class I. You need to be sure and level the mandibular arch. If this is not done prior to the AdvanSync being removed then as the jaw drops back then the overjet will return.

The AdvanSync Molar to Molar Class II Corrector has allowed us to simultaneously correct our Class II while accomplishing most of the orthodontic tooth movement. The appliance has been much more comfortable for our patients than previous designs. The acceptance of the patients and parents has been phenomenal. With the AdvanSync Molar to Molar Class II Corrector, we are able to be friends with our patients and treat them in much less time. We are orthopedically correcting Class II patients in virtually the same time as normal Class I cases. AdvanSync cases to date appear to have better facial orthopedics than with previous fixed functional appliances.

The AdvanSync Molar to Molar Class II Corrector is available in a kit or through lab fabrication at AOA Laboratories. In mixed dentition cases or some unusual permanent dentition cases, we use AOA Laboratories to fabricate the appliance. If you are accustomed to having laboratories make your appliances or want a custom design, AOA Laboratories will provide great service. Mixed dentition cases require custom-made appliances. At this time, the kit was not designed to be used in mixed dentition cases. The size of the appliance makes it a wonderful choice for mixed dentition Class II orthopedic treatment. If the case is sent to AOA Laboratories, then of course, models will need to be sent and the crowns are fit by them.

**Author Bios**

**Terry Dischinger, DDS**, is considered nationally as a leader in both functional jaw orthopedics and orthodontic technology and has lectured extensively throughout the United States. He has written numerous articles published in national orthodontic journals. Dr. Dischinger is a member of several national study clubs, which deal in the latest techniques in orthodontics. His training and experience also encompasses treatment of facial pain and jaw disorders (TMJ). Dr. Dischinger holds three academic degrees, including a bachelor’s degree in chemical engineering from Purdue University, a dental degree from the University of Tennessee and two-year doctoral graduate training in orthodontics from the University of Oregon Health Sciences Center. Dr. Dischinger is a member of the American Association of Orthodontists (AAO). He established his orthodontic practice in Lake Oswego, Oregon, in 1977.

His previous career includes a U.S. Olympic gold medal in basketball, NBA Rookie of the Year and All-Star status during his nine-year career in the National Basketball Association. He also served his country as an officer in the U.S. Army.

**Dr. Bill Dischinger** has lectured both nationally and internationally on a variety of subjects, including functional jaw orthopedics, indirect bonding and practice management from a team approach. He is also one of 12 certified Damon instructors who have taught and lectured extensively on passive self-ligation with the Damon System. Bill has written several articles published in Clinical Impressions and Orthodontic Products and is actively involved in national study clubs that address the latest treatment techniques. He completed his dental training at Oregon Health Sciences University in 1997 and his orthodontic residence at Tufts University in Boston in 1999. Bill grew up in Lake Oswego, Oregon, where he has practiced with his father, Dr. Terry Dischinger, since 1999. Bill and his wife, Kari Lynn, have four sons, Taylor, Turner and twins Trey and Tristan.