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Message from the President

Paul Keel

Last fall, 3M Unitek acquired Lingualcare, Inc., developer of the novel iBraces™ Appliance System for invisible orthodontics. I want to give you an overview of the system and let you know how integration of our two organizations has progressed.

By way of overview, the iBraces system is the only 100% customized invisible bracket system available on the market. Utilizing advanced digital technology, each bracket is custom formed to the unique anatomy of the tooth, allowing for the lowest profile and tightest tolerances. Every archwire is custom made with the patient’s individual prescription programmed in. And each case is delivered with a custom bonding tray to ensure precise bracket placement and bond reliability. Led by founders Lea Nesbit and Ruedger Rubbert, Lingualcare and 3M Unitek quickly merged operations. The iBraces system is now available in the U.S. and Canada, with additional market launches planned.

You have many good aesthetic options available to you. We were attracted to Lingualcare because it uniquely meets the highest quality standards you expect from 3M. Because iBraces brackets are fixed appliances, patient compliance is not an issue. And because they are on the lingual side of the teeth, they are truly invisible. Unlike clear aligners, iBraces appliances can be used to treat all cases. And because the brackets are 100% individualized, the wires pre-bent, and the bonding trays custom-formed, many of the challenges of previous lingual appliances have been ameliorated.

We think these features are distinctive and compelling, but the primary reason that we chose to work with Lingualcare was because, in speaking with our customers, you told us that the iBraces system could really help you differentiate and grow your practices. Early indications are proving this to be the case.

To learn more about the iBraces system, please contact your 3M Unitek Sales Representative. We thank you for your feedback that led us to this exciting new opportunity. As long as you keep telling us how we can better serve your needs, we’ll continue to strive to deliver on that promise.

Many thanks,

Paul

3M Unitek Receives Waste Reduction Recognition

The Waste Reduction Awards Program (WRAP) recognizes California businesses that have made outstanding efforts to reduce non-hazardous waste and send less garbage to our landfills. Presented by the California Integrated Waste Management Board, the award covers results achieved during 2007.

The following accomplishments were indicative of the efforts generated in 2007 to earn this award:

• 3M Unitek made improvements to its waste reduction programs, which resulted in increases for the amount of waste recycled.

• Improvements were made in environmental training programs, which are also used to update employees on the company’s progress toward waste reduction goals.

• 3M Unitek’s 2007 waste reduction efforts resulted in over $100,000 worth of cost avoidance.

3M Unitek has a history of making determined efforts to protect the environment. The 3M Unitek facility was named a National Environmental Performance Track member facility by the U.S. Environmental Protection Agency in 2004 and renewed in 2007. This prestigious designation recognizes 3M Unitek for voluntarily exceeding environmental protection requirements in the past, and for its plans and commitments to do so in the future. Only 500 facilities have achieved this distinction nationally, including 16 3M facilities.
The Tandem Archwire Technique: Enhanced Rotational Control with 3M Self-Ligating Appliances

by Dr. Charles Rodrigue

Passive self-ligating appliances present many advantages in the treatment of our patients, but they also make it necessary for us to change our way of approaching the various stages of orthodontic treatment. In my training days, I was taught that there are four stages in an orthodontic treatment: 1. Leveling and aligning; 2. Space consolidation; 3. Space closure; 4. Finishing. These stages were addressed in this order because of the various combinations in bracket-archwire-ligature that were available in those days.

Many orthodontic residents are still trained with these stages in mind and many of our experienced colleagues still apply them in their day-to-day practices. But technical and metallurgical evolutions have made it necessary for us to modify our way of thinking.

In the traditional twin bracket technique, leveling and aligning were taken care of in the first few months of treatment. With the metal ligation of the archwire in the bracket, rotations were quickly corrected because the ligature made it possible to seat the archwire to the bottom of the bracket slot allowing for the creation of the necessary force moment to rotate the tooth. With passive self-ligating appliances, this intimate contact between the archwire and the bottom of the bracket slot is no longer possible. In fact, with an initial archwire of 0.014 and depending on the bracket lumen and width of the bracket, as much as 10° of play is possible, and therefore the initial rotations cannot be completely corrected with the initial archwire.

If one were patient enough, with the gradual increase in archwire size (as in other self-ligating bracket protocols), the rotations would eventually be corrected by the time he/she reached the working archwire. But patience with rotation correction is not something we were trained for and most of us are uneasy being outside our comfort zone. Also, this traditional archwire progression increases the number of archwires needed to treat the case. This is where the Tandem Archwire Technique comes in handy. Not only is it an efficient technique but it reduces the amount of hardware required to treat our patients.

I was first introduced to the Tandem Archwire Technique by one of my friends, Dr. Paul Castonguay. It immediately made sense to me. The technique is quite simple: at the patient’s second appointment, a second small radius size archwire is inserted in the brackets on top of the original archwire. Doing so, the slot is completely filled in the bucco-lingual dimension, allowing the twin archwires to correct the still present rotations. In an 0.022 slot bracket, it is possible to insert one 0.014 archwire and one 0.016 archwire; in an 0.018 slot bracket, it is possible to insert two 0.014 archwires. Because these archwires are round, they don’t sit one on top of the other and instead place themselves in a manner that completely fills the bracket slot in the bucco-lingual dimension. In some cases, if needed, they will even fill in the bracket slot in the occluso-gingival dimension (Figure 1).
The technique was first used with two 0.014 archwires, but recent technical drawings have shown that in the 0.022 slot bracket, one can insert a 0.014 archwire and a 0.016 archwire (Figure 2A-B). Obviously, in a 0.018 slot bracket, only two 0.014 archwires can be inserted (Figure 3).

In severely rotated teeth and in the 0.022 slot, the tendency would be to place an 0.016 over the 0.014 archwire. However, care must be taken because the 0.016 archwire will induce a slight constant pressure on the bracket clip. If it positions itself as in Figure 1B and there is a severe rotation, it will be more inclined to disengage spontaneously. In these cases, I would suggest using two 0.014 archwires. The second archwire will have a higher probability of placing itself along one of the horizontal walls of the slot and it will therefore be held in place by the clip (Figure 1B). This problem is usually seen when one inserts the tandem archwire too soon and the initial archwire has not had the opportunity to completely express its potential.

How long should one leave the tandem archwires in place? I would suggest leaving them in place until you are ready for a 0.017 x 0.025 (either Nitinol or Beta III) in the 0.018 slot or 0.019 x 0.025 (either Nitinol or Beta III) or 0.021 x 0.025 Hybrid Nitinol in the 0.022 slot.

Clinical Cases

Case No. 1 (Figure 4A-B)
A. Initial occlusal view (10/24/2007) B. Lower incisors alignment after 8 weeks of Tandem Archwire Technique (12/06/2007 – 01/31/2008). One more appointment and a rectangular archwire can be inserted.

Case No. 2 (Figure 5A-B)
A. Initial occlusal view (09/13/2007) B. Lower incisor and canine alignment after 9 weeks of Tandem Archwire Technique (11/14/2007 – 01/23/2008). At that point a rectangular archwire can be inserted because the rotations on all incisors and both canines are corrected.

Case No. 3 (Figure 6A-B)
A. Initial occlusal view (11/29/2007) B. Tandem archwire inserted (01/28/2008) to help complete rotation correction on tooth number 3.2 (23). Picture B was taken at day of insertion of tandem archwire.

Case No. 4 (Figure 7A-B)
Initial bonding was done on 04/24/2007. A 0.014 CuNiTi was left in for 36 weeks. The tandem archwire was inserted (01/28/2008) on 11/15/2007. Picture B was taken 9 weeks later. At that point, the tandem archwire is left in place for another appointment. The incomplete correction of tooth 3.2 (23) was the result of having ligated it thus preventing free rotation on its axis. I’d also like to emphasize the arch width development in this case.

Figure 1A-B: Possible dispositions of tandem archwires in an 0.022 bracket depending on the position of the tooth. If the tooth requires a bucco-lingual movement, the archwires would position themselves as in A. If the tooth requires more occluso-gingival leveling, the archwires would position themselves as in the drawing B. Obviously, all possibilities between these two may be encountered.

Figure 2A-B: In both bracket sizes (0.022 and 0.018), the distance from bottom of the slot to the underside of the clips is 0.0270. In the 0.022 slot, the tandem archwire with two 0.014 archwires will occupy 0.0255 of space. With a 0.014 and a 0.016, they will occupy 0.0283 of space. In that case, a slight permanent pressure can be exerted on one of the clips. Clinically this will not produce breakage of the clip.

Figure 3: In the 0.018 slot bracket, because the occluso-gingival dimension of the slot is narrower, two 0.014 archwires will occupy 0.0274 and this is the maximum combination you can use in this bracket slot size.

Figure 4A-B: A. Initial occlusal view (10/24/2007) B. Lower incisors (12/06/2007 – 01/31/2008)

Figure 5A-B: A. Initial occlusal view (09/13/2007) B. Lower incisors and canines (11/14/2007 – 01/23/2008)

Figure 6A-B: A. Initial occlusal view (11/29/2007) B. Tandem archwire inserted (01/28/2008)

Figure 7A-B: A. Initial bonding (04/24/2007) B. Tandem archwire inserted on 11/15/2007. B was taken 9 weeks later.
A Few Precautions
The Tandem Archwire Technique does require that the practitioner modify some aspects of his/her technique. One of these aspects is the use of crimpable stops to prevent the archwire from sliding from one side to the other. Often, these stops are crimped on the archwire at the midline or in between two premolars. If this is done on the first archwire, it will be impossible to insert a tandem archwire over it without excessively distorting the archwire over that stop. In our clinic, we try to either cinch the first archwire distal to the first molars (allowing extra length if expansion of the arch is desired). If this is done, the tandem archwire can be inserted at the second appointment from second molar to second molar or from first molar to first molar. In some cases where no movement of the initial archwire is desired, crimpable stops can be placed distal to the first molars at the initial appointment. The tandem archwire can then be placed from second bicuspid to second bicuspid at the next appointment (Figure 8A-B).

I mentioned earlier in the article that many of us are sometimes eager to change an archwire in order to justify the monthly fees patients pay. In correcting rotations, this is a mistake. The tandem archwire should be inserted once the initial 0.014 archwire has completely expressed its potential. If a rectangular archwire disengages from a clip due to rapid archwire progression, the tandem archwire will do the same. Be patient!

One more precaution, if the tandem archwire is inserted too early and you feel that you need to ligate the bracket, not only will you be doing a useless act in a self-ligation concept, but the binding the ligature will create in the bracket-archwire-ligature combination will slow down the rotation correction by preventing the tooth from rotating on its axis (because it needs to overcome the friction created by ligation). Case No. 4 is a perfect illustration of that concept where tooth no. 3.2 (23) lags back because it was ligated when the tandem archwire was inserted.

Conclusion
The Tandem Archwire Technique is a great addition to a clinician’s armamentarium. Not only does it allow for a quick archwire change appointment, but it is also very effective in correcting rotations and leveling and aligning the dental arches given one respects these simple rules:
- let the initial archwire completely express itself,
- don’t ligate the second archwire to allow quick and efficient rotation, and
- change to a rectangular archwire once all rotations have been corrected.

Don’t hesitate to adopt the Tandem Archwire Technique when treating your patients … you’ll enjoy every advantage it brings to a busy practice whether you’re using the SmartClip™ and/or the Clarity™ SL Self-Ligating Appliances.

Clinical images provided by Dr. Rodrigue.

Clarity™ SL Appliance System Expands Lineup
The Clarity™ SL Self-Ligating Appliance System has more than doubled its bracket availabilities with the announcement of 0.018 slot appliances as well as Roth* Prescription brackets. These new brackets offer the benefits of 3M’s unique true-twin design and the advantages of the proprietary self-ligating clip to many more practitioners who may prefer this slot size or prescription. Ask for the Clarity SL Appliance System parts sheet (016-956) for details of the expanded bracket selection.

Bracket handling can be easier with the new Unitek™ Bracket Placement Instrument (REF 804-171). Designers at 3M Unitek considered the special requirements of both self-ligating appliances and brackets with APC™ Adhesive precoating to create a user-friendly functional appliance specifically designed for ease of use.

Look for a new set of archwires specifically designed with low force levels ideal when treating with 3M Unitek Self-Ligating Appliance Systems. The new archwires are listed to the right and are also featured in the 2008 3M Unitek Product Catalog.

For details, ask your 3M Unitek Sales Representative or visit the 3M Unitek website at www.3MUnitek.com.

*3M Unitek version of this prescription. No endorsement by the Doctor is implied.
Introduction
Orthodontic anchorage is defined as the resistance to unwanted tooth movement. Traditionally, anchorage in orthodontics is classified as minimal, moderate and maximum based on the extent of incisor retraction versus molar protraction. In recent years a new classification of anchorage has been defined as absolute anchorage for situations where the anchorage units are completely stationary in response to reaction forces applied to move teeth.

Historically, endosseous implants have been used to achieve absolute anchorage. These implants usually osseointegrate into the bone and are used through either a direct or an indirect fashion. Direct anchorage with these endosseous implants describes implants placed in the dental arch with the intent for future restoration of a missing tooth, while indirect anchorage is used for implants placed purely for orthodontic purposes and not future dental restoration.² The introduction of mini-implant temporary anchorage devices (TAD) has made this definition of direct and indirect anchorage obsolete, as these devices are rarely placed with the intention of future dental restoration.

Direct anchorage with such TADs describes situations where the teeth desired to be moved are pitted directly against the TAD. Indirect anchorage on the other hand, refers to the stabilization of certain teeth in the dental arch, and subsequent use of these stabilized anchors to move other teeth in the dental arch. The purpose of this review is to familiarize readers with various uses of mini-implant TADs, and review indications of direct or indirect anchorage.

Placement Sites
The recent increase in popularity of TADs is due to the significant treatment advantages they provide. It is now possible to move teeth in directions previously unattainable, such as movement of teeth in the anteroposterior and vertical directions. Posterior teeth can be mesialized through narrow atrophic ridges (Figures 1 and 2), distalized to correct class II molar relations and create space in the dental arches, intruded to aid in correction of anterior openbite malocclusion (Figure 3), while incisors can be intruded to improve excessive overbites (Figures 4 and 5). In addition, TADs can aid in the corrections of canted occlusal planes without surgical intervention, and preprosthetic orthodontics for the mutilated dentition. The highly polished surfaces of these mini-implant TADs do not osseointegrate, making their placement and removal dramatically simpler compared to their endosseous predecessors.

Figure 1: Mandibular molar desired to move mesially through a narrow atrophic ridge.

Figure 2: Mandibular molar moved mesially 5 mm, using the Imtec Ortho Implant as anchor.
Selecting the ideal location for TAD placement is dependent on the amount and quality of bone available at the selected site, as well as the desired tooth movement. Commonly they are inserted interradicularly, in the attached gingival, away from moveable tissues such as frenum. Other common locations include the paramedian region in the palate, retromolar area and the infrazygomatic crestal bone.

Direct Anchorage
Mini-implant TADs can be a direct source of anchorage when they directly receive the reactive forces of a moving tooth or group of teeth. Commonly, the segment of dentition desired to move is connected to the TAD through an elastic chain module, or a coil spring. Site selection for the implant can vary from sites away from the dentition, such as retromolar area, the zygomatic crestal bone, mandibular symphysis, and the anterior nasal spine, to sites between dental roots.

At times, alterations in treatment mechanics may be required, as there is both a vertical and anteroposterior discrepancy between implant site and site of force application. Posted archwires provide a useful tool in minimizing the vertical discrepancy (Figure 6). On the other hand, the direct anchorage force systems are easy to design, and require no laboratory appliance fabrication. Though most published reports have concentrated on interradicular use of direct TAD anchors, this form of anchorage can be very useful to intrude posterior teeth in the treatment of openbite cases, when placed in the infrazygomatic crest (Figures 7 and 8), and in retraction of the entire arch in the treatment of Class III dental malocclusion, when placed in the retromolar region.

Indirect Anchorage
Mini-implant TADs can also be connected via a bar or a wire to a stabilized tooth, which receives the reactive forces of tooth movement. The simplest indirect anchorage system is derived from a transpalatal bar connected to a TAD placed in the midsagital regions. Figures 9A and 9B demonstrate a transpalatal arch soldered to the comfort cap of the IMTEC Mini Ortho Implant. This arch is then used to stabilize the maxillary first molars via fluoride releasing band cement (Transbond™ Plus Light Cure Band Adhesive) (Figure 10). The main advantage of such systems is that they rarely require any alterations in treatment mechanics. However, they require an additional step for appliance fabrication. The use of palatal anchorage also reduces the number of mini-implant TADs required per patient. For instance, to aid in anterior tooth retraction in figure 10, only one palatal implant was needed, while with direct anchorage bilateral interradicular TADs would be required.

Figure 6: Posted archwires to reduce the vertical vector of force application.
Figure 7: DM, Initial measurement of anterior openbite: 2.5mm, June 06, placement U 2/06.
Figure 8: DM, Openbite reduced to 1.5 mm after a 6 week activation period.

Figure 9A-B: Fabrication of TPA using the Imtec Comfort Cap.
IMTEC Ortho Implant

During the past four years, I have experimented and experienced the ups and downs of 6 mini-implant systems. My personal preference is the IMTEC Ortho Implant, as it is one of the most versatile implants systems available. The Ortho Implant has a tapered design with a diameter of 1.8 mm. There is a 0.7 mm hole in the head to allow for ligature. They are fabricated from titanium alloy and are available in 6, 8, and 10 mm lengths. The IMTEC Kit includes a soft tissue punch, drivers, pilot drill and healing caps. Though included in the kit, soft tissue punch and pilot drilling are rarely indicated, making the placement procedure a simple, blood-free process. In fact the use of tissue punch is only advocated when the implant is to traverse thick fibrous gingival tissue, such as in the palate. Auxiliaries to the kit include a contra-angle driver, essential for implant placement in the palate and retro-molar areas, and Nitinol springs for tooth movement. For placement, generally topical anaesthetic is sufficient tissue preparation. This allows for patient feedback if the mini-implant approaches vital tissues and nerves during the placement procedure. No pilot hole is necessary, as the Ortho Implant belongs to the self-drilling/self-tapping group of mini-implant TADs, which have a cutting end on the implant allowing self-advancement through the bone.

The most common complication is implant loosening and failure, occurring in as many as 10% of cases. Other complications involve damage to adjacent tissues, and implant fracture. The later is unlikely to occur with the IMTEC Ortho Implant due to its tapered design. In a recent study of various common brands of orthodontic mini-implants, the Ortho Implant was the only mini-implant which did not fatigue and fracture during placement, recording the highest peak torque values during placement.

These orthodontic mini-implants have revolutionized orthodontic treatment. They have led to a paradigm where we have had to alter our approach to treatment planning our cases and executing our mechanics. They are powerful aids in the correction of complex malocclusions and are well on their way to becoming a mainstay in the modern orthodontic offices.

References

Clinical images provided by Dr. Razavi.

3M Unitek Introduces Transbond™ Supreme LV Low Viscosity Light Cure Adhesive

Transbond™ Supreme LV Adhesive is a low viscosity, flowable adhesive with features advantageous for indirect bonding or wherever a flowable orthodontic light cure adhesive is indicated.

One of the main advantages of this adhesive compared to other flowables is its On-Demand Flow characteristic: it flows when extruded under pressure from the syringe but stays put with no slumping or running prior to light curing. Packaged in light protective syringes, convenient metal syringe tips precisely dispense the desired amount of adhesive accurately without waste or run-on.

Taking advantage of proprietary 3M nanotechnology fillers, Transbond Supreme LV adhesive offers excellent strength, flow and wear properties. You’ll find bond strength similar to the industry benchmark Transbond™ XT Adhesive, and compatibility with all 3M Unitek primers, to make the bonding process even easier.

Transbond Supreme LV adhesive is the latest addition to the Transbond™ Adhesive family. The adhesive is available now from your 3M Unitek Sales Representative.
Ten Tips to Successfully Integrate the iBraces™ Appliance System into Your Practice

by Dr. J. Clifton Alexander

1. **Select the Right Patients**

When you start a new procedure or try a new appliance, it is always best to carefully choose the patient that you will “experiment” with. When I do this, I am very up front with the patient, telling him or her that I am going to try something new, and that it holds great promise. I also usually give my very first patient a significant discount for being my guinea pig, saying, “We will learn together.”

In terms of the specific patient, there are two main areas of consideration when choosing your first iBraces™ Appliance System patient. The first is the difficulty of the case. I always highly recommend orthodontists to start their first case on a Class I, minor-to-moderate crowding, non-extraction case, one that might qualify for removable aligners, for example. If a patient comes to my office requesting aligners, but I feel like there is just too much to be done, I thoroughly explain the need for full control of each individual tooth with a fixed appliance and the ability the fixed appliances give me to get the teeth straight and the bite right. Otherwise, I explain, we would both be frustrated and disappointed.

The second consideration when choosing a patient is personality. It is best to have a more laid-back, go with the flow type than a high-maintenance, Type A person. You want a patient who is willing to let you play with the system, learning as you go, while not losing confidence in you or the system. Proper communication at the beginning is critical for this. Also, a more relaxed individual will not lose his or her patience during the course of treatment.

2. **Obtain Proper Training**

There is no question that there is a definite learning curve in going from labial to lingual. There are, however, several training opportunities and courses that can help you get started. Lingualcare, which manufactures the iBraces system, has exceptional training, both initial and continuous. You can choose between live and online training to get the orthodontist/staff introduced and certified with the system, and multiple continuous training options are available as well. The most valued among those that use it is the on-site training by a clinical trainer who will assist the orthodontist with the initial bonding and archwire insertion, and will train the staff during the process. Orthodontists have hailed it as critical in the success of climbing that learning curve and making it fun and exciting. The advanced Lingual Mechanics course is also of great benefit once a doctor has completed the Quickstart certification process and is occasionally accompanied with an in-office portion with the opportunity to actually see live patients being treated in the presenters’ office.

You can choose between live and online training to get the orthodontist/staff introduced and certified with the system, and multiple continuous training options are available as well. The most valued among those that use it is the on-site training by a clinical trainer who will assist the orthodontist with the initial bonding and archwire insertion, and will train the staff during the process.
3. Take it Slow and Involve Your Staff

The first few cases will take a little longer than normal simply because you and the staff are progressing through the learning curve. Schedule your first few lingual patients at slower times of the day so that you can create a nice, fun, and relaxed atmosphere in which to treat and to learn. Patients will appreciate this. They will be the center of attention and will feel totally taken care of. Even though you'll want to plan on slightly longer appointments for your first few patients, the overall treatment time should not be significantly affected, since you will be very attentive and efficient with these cases. The longest appointments will be the initial bonding—maybe 1 to 1.5 hours until you get the process down, then only 45 to 60 minutes.

Archwire changes should not take more than 20 to 30 minutes if you’ve properly let the previous archwire work until it is fully ligated and passive. Most of the time, routine adjustments between archwire changes are very short and easy appointments for the office and the patient.

Most of the practices that I see that have successfully integrated the iBraces™ System have involved their staff from the very beginning. Of course, it is imperative that the orthodontist be the most familiar and comfortable with the techniques and procedures but a well-trained assistant and front-office staff are key.

The orthodontist will eventually rely on the assistants to be just as comfortable with routine adjustments, such as archwire changes, as they are with the labial technique. The orthodontist will need to rely on accurate communication from the front desk about the differences and advantages of the appliance when asked by patients on the phone or in the office.

Offices that have staff that are trained at the same time as the orthodontist have the most success, and the most fun, with the iBraces system.

If a patient has come with removable aligners on his or her mind but doesn’t qualify for that type of treatment modality, then I explain to him or her that there is less control with those than with fixed appliances, and that we want to get it right the first time. I then proceed to explain and discuss the fixed appliances. I first show him or her two typodonts, one with metal labial brackets and another with clear labial brackets. I explain the slight differences between the two, and talk about immediate oral-hygiene issues like food particles between the brackets after a meal and temporary soft-tissue irritation.

Then, I take the third typodont off the shelf, with the iBraces system, and say, “Now, if you want all of the same benefits of those other two but with an appliance that is 100% invisible, you could have these.” Then I open the typodont to reveal the iBraces appliances. In describing the appliance to patients I tell them about the technology behind it and also warn them about minor, temporary tongue irritation. It is very important that patients know both facts.

The understanding of the technology, individuality and customization gives the appliance value to them, so that when the treatment coordinator tells them the fee, they are not surprised, unless it is actually less than they thought which does happen. The information about possible tongue irritation and speech interferences is critical. I tell him or her that he or she may or may not have any problem, since everyone is different; but in the worst case, just give it two weeks and he or she will be over the hump. Some patients report absolutely no problem at all, and some take the full two weeks. They all eventually say it would not have kept them from having lingual appliances and would do it again because of how their teeth “magically” straightened.

5. Use Recommended Bonding Procedures

Proper bracket positioning is paramount with any orthodontic appliance, even more so in lingual. The iBraces system covers a majority of the lingual surface, fitting the flush gold pad exactly to the tooth. Not only does do they precisely fit the anatomy of the tooth with the custom pad, but if one comes off during treatment, it is very easy to place it back in its original position accurately. This preserves the prescription and avoids the need to bend wire.

4. Educate the Patient

The new-patient exam is when relationship, trust and rapport are initiated. It is also a critical time for patient education. In my office, after I make the initial diagnosis and present the treatment plan to the patient, I explain what types of appliances will get us to the goal line.
iBracket™ Custom Brackets are delivered in indirect bonding trays, ready for accurate placement. Follow the procedures outlined in your procedures guide to the letter. These procedures are proven, the materials have been tested and if you use them as directed you and your patients will have a great bonding experience.

I can’t emphasize enough how important it is to follow the procedure for rebonding exactly as described. iBracket custom brackets do not have mesh pads. The gold bracket will not bond directly to the enamel tooth surfaces. The back of the brackets need to be chemically prepared for the bonding procedure to work.

6. Use the Recommended Instruments
While it is possible to immediately start treating with lingual appliances using the same instruments you use for your labial appliance, there are certainly several tools and instruments that make it easier. There is a recommended list of iBraces system instruments that you should obtain. Many of the instruments are smaller and oriented to the lingual for easier use.

My staff and I very much appreciate a heavy, double-ended ligature director with a rectangular slot. This instrument is used to not only tuck metal ligatures, but also to direct and torque the archwire into the slots. One end is straight, the other is bent. Another instrument that is a great help in lingual orthodontics is a double-sided pier that permanently bends any archwire, even the smallest NiTi wires, to a 90 degree angle for ‘cinch back’ bends.

In lingual therapy, we often cinch back the wire distal to the terminal molar for two reasons: to keep the smaller initial wires from slipping out of the tubes, and, most importantly, for comfort. If the smallest length of wire slides distally after being cut flush, it is a significant irritation to the tongue. If, however, the wire is intentionally left long by approximately 5 mm and is then cinched back, the wire is free to move with no consequence to the tongue.

7. Appreciate the Biomechanical Differences
Based on an accurate diagnosis and treatment plan, you will be able to switch from labial to lingual orthodontics without too much thought of biomechanics in the very beginning. The main focus for the entire team will be to get through the learning curve of your first few bondings, the recommended ligation techniques and archwire changes.

During the course of treatment, however, you will begin to see different effects that are important to consider from a biomechanical perspective. For instance, take into consideration the point of force application. The center of resistance of the tooth will be closer to the point of force application when brackets are placed on the lingual surface of the tooth, thus providing more efficient and many times quicker tooth movement. In deep-bite cases like Class II, Division II malocclusions, the maxillary anterior brackets serve as a bite plane, opening the posterior segments. This simple feature proves valuable in opening the bite and leveling the lower arch much more quickly than you can with labial brackets, and without unintended bracket interferences and failures. The depth of the differences of labial to lingual biomechanics is beyond the scope of this article, but more information can be found in the iBraces System Clinical Guide.

8. Be Prepared for Patient Patience
One of the most liberating aspects of the iBraces system is the improved tolerance from the patient. In the past, the lingual appliances had a larger profile, causing significant speech and comfort issues. Despite the fact that they were invisible, the patients, predominately adults, were as anxious to have them removed as if they were labial appliances. However, with the iBraces system, the speech and comfort has so vastly improved that, if I make the comment that we are getting close to the end of treatment, patients have told me to take as long as I need to finish. Many never pressure me to take them off. How great is that?

While I never let patients dictate treatment or pressure me to take appliances off too soon, it is an everyday occurrence that patients pester me and my staff with the questions, “How much longer?” or “When do I get these things off?” It is a welcome change when patients actually appreciate your work and commitment to getting the job done right within a well-estimated time frame. It’s what I call a patient patient.
9. Everything is Difficult Until it Becomes Easy

I have said this phrase thousands of times to patients when starting something new, whether it’s elastics, headgear, or simply just getting accustomed to the braces after the initial bonding. To the kids, I’ll use the analogy of riding a bicycle for the first time: Learning how to steer, balance, and pedal all at the same time is tough. Once they learn how, though, it’s a breeze, and they don’t even think about “how”—they just do it. It’s the same thing with the iBraces system. As long as the orthodontist and team recognize this principle and the previous eight tips, then this learning curve can actually be an enjoyable process; and before long, the office will “just be doing it.”

10. Enjoy Specializing Your Practice

Not only does lingual orthodontics offer a unique opportunity for the patient, but it does the same for your practice. Once you have successfully added lingual orthodontics to your practice, you will differentiate your practice from large, managed care-type clinics; other orthodontists reluctant to advance; and the general/cosmetic dentist using clear aligners or instant orthodontics, veneers and bonding.

Recent articles and analyses paint a not-so-rosy picture of our profession’s future based on the last few years. The May 2006 “McGill Advisory” reported results of a 2005 Annual Practice Profitability Survey. The survey compared production, expenses, and profitability of the seven dental specialties. There were several interesting things that we should note. It revealed that “Orthodontics is the segment of dentistry that has been most adversely affected by the economic changes over the past 6 years (2000-2005).

Most orthodontists have seen fewer new patients, and have encountered declining treatment acceptance rates over this time period, leading to fewer case starts. Most practices have maintained stable gross incomes (collections) only due to fee increases, averaging 2-4% annually. While some of us may or may not have experienced this trend, the McGill survey had a total of 309 responses, with 65 orthodontic respondents, and it clearly showed how orthodontists’ average gross collections have decreased over the last 6 years, while collections in the other six specialties have increased. If this survey is remotely predictive of our future, we should be concerned.

The survey also reported that, “Combined with increasing treatment efficiency this decrease in starts has resulted in a dramatic decline in ‘busyness’. Most orthodontists are now operating at only 70-80% of capacity, the lowest of any segment of dentistry.” In trying to find the cause, it said. “Few orthodontists realize that, in addition to competition from an increased supply of orthodontists, and from general dentists, their biggest competitor is actually producers of other goods and services that are chasing the consumer’s shrinking discretionary dollar.”

Larry White, DDS, MS, wrote a thought-provoking article in the Southern Association of Orthodontists News titled “A Mandate for Change”. In it he drew similar conclusions about how many of our potential patients were being lured by “instant” orthodontics. Many patients, he says, would prefer veneers or cosmetic bonding to enduring “the discomfort of separators, fitting bands, rapid palatal expanders etc., and complaining about the seemingly endless number of appointments…”

This is a perception that is driven largely by the media, which reports on the disadvantages of latter-day orthodontic therapy (such as long treatment, discomfort, and inconvenience) and, he says that unfortunately this is reality in most cases. He argues that our specialty will continue the downhill fall as illustrated by the McGill survey unless we explore new technologies to offer faster, more discreet treatment that is more convenient and less socially intrusive; and, most important, results that not only straighten teeth but also improve facial balance.

The iBraces appliance system, along with other technologies, can give our practices a tool to fill a consumer need that will place us back on top in the world of dentistry. We need to commit to furthering our education. We need to conquer the learning curve. We need to know that our patients are willing to pay for a more aesthetic, less destructive, and more controlled method of giving them the smile, and occlusion, that they want and need. As White concluded, “We are now better equipped than ever to offer an attractive solution that patients in the new millennium need and will demand. Are you ready? If not, what is holding you back?”

Correction of Class II Subdivision Malocclusion with the Forsus™ Appliance

by Dr. Don Murdock

Introduction

As a clinician, I find myself continually searching for efficient and predictable treatment methods which are also well received by our patients. The Forsus™ Fatigue Resistant Device has become my preferred method for correcting a unilateral Class II malocclusion with minimal cooperation and a high degree of predictability.

When treatment planning a subdivision malocclusion, it is important to differentiate the degree of dental and skeletal involvement. As such, at the new patient examination we routinely perform a brief facial analysis on the computer monitor. In addition to the dental malocclusion, the facial proportions as well as the dental and skeletal midlines are noted and initially discussed with the patient and/or parent.

After facial and radiographic analysis, along with review of dental models, the treatment goals are formulated. If a large discrepancy exists between dental and facial midlines, ancillary treatment including temporary anchorage devices (TADs) or asymmetric extractions may be required. A true skeletal asymmetry is optimally treated in conjunction with distraction osteogenesis or orthognathic surgery. The ideal case for unilateral correction with the Forsus appliance is one in which the maxillary midline is nearly coincident with the facial midline, the mandibular incisors are either upright or slightly retroclined, crowding is mild to absent and the asymmetry has a predominately dental component.

Case Report

A 15 year-old Caucasian female presented for correction of a deep bite, crowding and an “overbite”. Preliminary examination indicated that the patient’s nasal tip deviated slightly right and soft tissue menton was slightly left of the facial midline. The patient exhibited approximately 70% incisal overlap and a dental midline discrepancy of 3 mm. The patient exhibited a full step Class II dental relationship on the left with mild to moderate crowding of the lower incisors. (Figure 1A-E)

![Figure 1A: Facial Proportions (red). Facial midline and horizontal plane (black).](image)

![Figure 1B: Mild lower lip eversion and mild mandibular retrusion in profile.](image)
Without the TPA, the force generated at the attachment point of the Forsus appliance spring to the maxillary molar may have the additional favorable side effects of slightly rotating distal and expanding the attached molars. If no maxillary arch expansion is desired, buccal crown torque may be incorporated in the archwire.²

Clinicians have reported some temporary bite opening or canting of the occlusal plane with fixed functional appliance use, so monitoring progress at 6 week intervals may be advisable.

The Forsus appliance was activated with a 2 mm advancement twice over the 11 months it was in place. The patient wore conventional Class II elastics on her right side after school (at home) and at night for mild correction of her cuspid relationship on that side. Midlines and overbite were corrected after 9 months of Forsus appliance use, with the two additional months being used to create 1-2 mm of overcorrection. Bite opening on the left side of 2 mm from overcorrection with the Forsus appliance required pm vertical elastic wear to the cuspid on the affected side for two months. Total time for fixed upper and lower appliances was 24 months. Treatment objectives were met and the patient and her parents were very pleased with the result. Bonded lingual retainers were placed on maxillary incisors and from mandibular cuspid to cuspid.

Treatment Objectives

The primary treatment objectives for this patient were to decrease the curve of Spee, overbite and overjet. Correction of the Class II dental relationship as well as alignment of dental and facial midlines were also planned. Finally, transverse development of both arches, a decrease in lower lip eversion and overbite were also desirable.

Patient cooperation was considered questionable, and a Forsus appliance spring was discussed and agreed upon by patient and parents for correction of the Class II relationship on the left. Maxillary incisor position and lip support were adequate, which indicated overjet correction resulting from primarily mandibular skeletal and dental advancement would be desirable. Overjet correction with the Forsus appliance has been previously described as approximately one third advancement of the mandibular dentition, one third distalization of maxillary molars and one third via skeletal changes (advancement of the mandible and headgear effect on the maxilla).¹

Upper Clarity™ MBT™ Appliances with 0.019 x 0.025 archwires were placed and the maxillary arch leveled for two appointments, after which, lower Victory Series™ MBT™ fixed appliances were placed. After a few wire successions at subsequent appointments to level and align the mandibular arch, the 0.019 x 0.022 maxillary and 0.019 x 0.025 mandibular stainless steel working archwire sizes were inserted with the Forsus™ Fatigue Resistant Device. The entire lower arch was continuously ligated with stainless steel ligature wire to prevent spacing and excessive proclination of the mandibular arch. Lingual crown torque may be incorporated into the mandibular arch as an additional step in preventing excessive proclination of incisors. If additional maxillary molar distalization is desired, a 0.018 stainless archwire may be placed in the upper arch to decrease frictional forces during translation and a lower lingual arch may be utilized² (Figure 2). If less maxillary molar movement had been desired, a fixed transpalatal arch (TPA) would be placed.

Summary

In my experience, the Forsus appliance has earned a reputation for reliability and ease of use. My clinical staff have been trained to place and remove the appliance with minimal chair time, especially with the newer Forsus™ Fatigue Resistant Device EZ Module. Fortunately, the breakage problems associated with Herbst® or various spring-type fixed functional appliances have not been an issue with this fatigue resistant design spring. Use of this appliance does not have the disadvantage of significant molar extrusion as often noted with Class II elastics.³ The unilateral correction of the Class II subdivision malocclusion is one of several clinical uses for this appliance which produce excellent results in an efficient manner. (Figure 3A-F)
References

Clinical images provided by Dr. Murdock.

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