Orthodontic Perspectives
Innova
News, Information, and Clinical Case Studies
Message from the President
3M Unitek

It's hard to believe another AAO session is upon us, but it's wonderful to be in San Francisco. I'm looking forward to meeting many of you and hearing your comments and questions about our products. We're pleased to partner with you to provide the tools you need to continue doing a great job for your patients.

3M Science. Applied to Life™. This is more than just a phrase you will frequently see on items from 3M. It is our way of going about our business. It is what we do in serving you, our customers.

We apply 3M Science to provide benefits in everyday life, often by combining technologies in new ways. For example, the APC™ Flash-Free Adhesive Coated Appliance System uses our expertise with advanced adhesives and nonwoven fiber materials to offer an advanced product that saves you time, has a low bond failure rate and improves the patient experience. Using science to change lives – that's what really matters.

In this issue you will have the opportunity to learn about our new Victory Series™ Superior Fit Buccal Tubes. Extensive research into buccal tubes with those who use them, discovering how they can be made better, and applying the depth of 3M Science has resulted in an appliance that has features to improve the user experience and help toward better treatment results.

Another way we strive to improve the treatment experience is by offering aesthetic options for patients who don’t want the look of wearing braces. Our Clarity™ ADVANCED Ceramic Brackets are comfortable and provide excellent aesthetics by blending in with the patient’s natural tooth color. And the Incognito™ Appliance System combines the completely invisible look many patients want with the functionality (for you and your staff) of a treatment system that can include full digital workflow.

3M™ Self-Ligating Appliance Systems offer a full range of designs that provide treatment efficiency and can save patient’s time. In this issue we highlight our Victory Series™ Active Self-Ligating Brackets, introduced last year, with the experiences of users and the results they achieved. There is also an article about our SmartClip™ and Clarity™ SL Self-Ligating Systems.

I hope you'll take a few minutes to enjoy this issue of Orthodontic Perspectives Innova. If you're in San Francisco for this year's AAO Annual Session, please stop by our booth and share your insights with us. Or give us a call or send us a note. We always enjoy hearing from you – and partnering with you – to better meet patients’ needs.
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**Vertical Control Assisted with TADs: A Case Report**  
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Victory Series™ Superior Fit Buccal Tubes Introduced
Better Fit for Better Results

Armineh Khachatoorian, Brand Manager, 3M Unitek

Armineh Khachatoorian received her B.S. in Chemistry from the University of Southern California. She worked as an R&D and Product Development Engineer before joining 3M Unitek in 1997 as a Sr. Technical Service Engineer in R&D. In 2002 she became a Marketing Product Manager, and is now Brand Manager responsible for Adhesives, Ligated Appliances, Tubes and Bands, and APC™ Adhesive Systems. She has participated in the introduction and marketing of the Ortholux™ Luminous Curing Light, the APC™ Flash-Free Adhesive System and other adhesive products.

3M Unitek surveyed orthodontists from around the world to understand the performance and features they deemed most important in buccal tubes. Their top priorities were good tooth-to-base fit, ease of wire insertion, patient comfort and ease of positioning and handling.

Victory Series™ Superior Fit Buccal Tubes were designed to meet orthodontist requirements, starting with a large compound contour base for superior fit and stability. They also feature an exclusive contoured funneled archwire slot for easy wire insertion, a low profile and flush-mount hook for added patient comfort, and improved gripping and handling characteristics.

For more information, read the article that follows, visit 3MUnitek.com/SuperiorFit, or contact your 3M Unitek representative!

Being a huge advocate of only banding lower molars, I was very skeptical of even trying a bonded bracket on the lower 6’s. The new Victory Series™ Superior Fit Buccal Tubes just fit so well into the occlusion, and having them fit right into our pre-coated bonding system made it seamless. Overall, I could not be happier…

Dr. Scott McCranels, West Palm Beach, Florida

We all loved the design of the actual tube. The fluted/flared mesial opening made wire insertion simple, even in difficult mesially rotated molars. The tube is easily held for placement during bonding... extremely secure and very unlikely to slip or spin as occurs frequently with other tubes we have used.

Dr. Ross Taddeo
Orlando, Florida
Improving Orthodontic Treatment with Victory Series™ Superior Fit Buccal Tubes

Todd Oda, Product Development Engineer, 3M Unitek

Todd Oda is a Product Development Engineer at 3M Unitek. He has over 15 years of experience in the orthodontic industry focusing on developing innovating self-ligating brackets. He received his B.S. in Mechanical Engineering from California State University, Long Beach. Todd has over 25 years of experience in the medical, semiconductor, and welding industries.

Ana Trinh, Product Development Engineer, 3M Unitek

Ana Trinh is a Product Development Engineer at 3M Unitek. She has over eight years of experience in the medical and aerospace industries. She received her B.S. in Mechanical Engineering from University of California, San Diego, and her M.S. in Mechanical Engineering from California State University, Fullerton.

Reliable anchorage is an important aspect of the orthodontic bonding process, affecting efficiency throughout treatment. Along with treatment choice and mechanics, selection of the buccal tubes is an important determinant of success.

3M Unitek surveyed users of buccal tubes, worldwide, asking them to name the most important attributes of a buccal tube. The respondents were users of tubes from many manufacturers, including 3M Unitek. The results of the survey indicated that good tooth-to-base fit was the number one requirement among all respondents, followed by ease of wire insertion, ease of positioning and handling, and patient comfort.

Using this information, the 3M Unitek design team leveraged 3M’s advanced technologies and 60+ years of orthodontic design experience to develop Victory Series™ Superior Fit Buccal Tubes. Complex 3D modeling, finite element analysis and the 3M Software, Electronic, and Mechanical Systems (SEMS) group’s custom software were all used in the design.

Victory Series Superior Fit Tubes are made of 316L stainless steel and use 3M Unitek’s proven Metal Injection Molding (MIM) technology for the most consistent and dimensionally accurate parts possible. The new tubes will initially be introduced in the MBT™ Appliance System Rx for the upper and lower 1st and 2nd molars, followed by Roth* Rx tubes. Double convertible tubes for both prescriptions will be available for the upper and lower 1st molar teeth. All of the Victory Series Superior Fit Buccal tube bases use the 3M Unitek 80-gauge micro-etched mesh for consistent and reliable bonds.

*3M Unitek version of this prescription. No endorsement by the Doctor is implied.
Optimum Tooth-to-Base Fit

As optimum tooth-to-base fit was one of the top priorities in designing the new Victory Series™ Superior Fit tubes, the SEMS group at the 3M corporate labs developed a proprietary software that created an ideal base from many patient samples, which was representative of the general population. New “ideal” bases were then designed around representative 1st and 2nd molar teeth.

Figure 1, shown below, illustrates a heat map comparing the computer generated molar to the Victory Series Superior Fit 1st molar base. In conjunction with the ubiquitous mesial-distal and occlusal-gingival curvatures of the base, outboard “wings” were added to the mesial and distal sides of the bases, shown in Figure 2. These proprietary “wings” bend around and “hug” the clinical crown of the tooth to add a new level of base to tooth fit.

Low Profile and Funnel Entry

In addition to improved tooth-to-base fit, the new Victory Series Superior Fit tubes feature improvements in reduced size, a newly designed funnel entry for ease of wire insertion and a flush-mounted hook for enhanced patient comfort.

Keeping the lower 1st molar buccal tubes out of occlusion with the upper teeth was a major design input criteria. Considerable effort was spent sculpting and reducing the occlusal profile of the tube. To maintain a reasonable funnel area with such a low profile tube, the mesial end of the tube was allowed to “grow” in the gingival direction. This increased the funnel entry area without negatively impacting the occlusal profile of the tube.

The funnel entry itself features curved funnel sides (instead of the normal straight sides) that gradually taper tangentially to the archwire (Figure 3). This allows the archwire to be smoothly inserted into the archwire slot without hitting any angled transition areas that are normally present with most straight-sided funnel entry systems.
Easier Bond Placement
To aid in bond placement, several new features were added. The gripping notch of the buccal tube was made substantially perpendicular to the torque plane of the bracket. In addition, the buccal side or top of the buccal tube was made parallel to the torque plane of the buccal tube. Having these surfaces either perpendicular or parallel to the torque plane gives the clinician multiple areas to push the buccal tube onto the tooth without having the buccal tube “shift away” during the bonding process. A mesial-distal visual line was also added along the buccal side of the tube to help the clinician align the buccal tube during placement on the tooth. Figure 4 illustrates the new features on the Victory Series Superior Fit buccal tubes used for bonding.

Enhanced Patient Comfort
The need for patient comfort was an important factor in the design of Victory Series™ Superior Fit tubes. Buccal tube hooks tend to protrude in the buccal direction to allow ease of elastic engagement. But this also can be a major source of irritation to the soft tissue inside the mouth. Unplanned visits for hook to soft tissue irritation is not uncommon if the doctor forgets to bend the hook lingually to reduce the amount of hook protrusion.

Victory Series Superior Fit tubes feature hooks that are flush with the buccal surface of the tube, and are also laid back lingually to reduce point load irritations to the soft tissue in Figure 5. Because the buccal tube is Metal Injection Molded from 316L stainless steel, which is a durable and malleable material, the hooks are fully bendable. The hook design as well as the low profile of the tube provide enhanced patient comfort.

Conclusion
Victory Series Superior Fit Buccal Tubes bring together in one design the most important features and desired improvements voiced by surveyed orthodontists worldwide. Many users in customer evaluations note that they can both see and feel the differences between these tubes and others they have been using, with noticeable improvement in tooth-to-base fit, ease of handling and positioning, and simple archwire insertion.
Victory Series™ Active Self-Ligating Brackets

Dr. Jeffrey A. Housley

Dr. Jeffrey Housley attended Oklahoma State University where he received a degree in Biology. He went on to the University of Oklahoma College of Dentistry, where he received his dental degree and orthodontic specialty training. He has published articles in professional journals relating to anterior crossbite and mandibular expansion. He has also lectured to hygiene and dental students at the University of Oklahoma College of Dentistry. He has a private practice in Owasso, OK.

Self-ligating brackets have been around in orthodontics now for quite some time. Over the first 12 years of my practice, I have had the chance to use several different types of self-ligating brackets. While there are a lot of factors that make a self-ligating bracket perform clinically at a high level, there are a few that we see as the most important on a day-to-day basis. Those factors are: ease of placement during bonding, ease of opening and closing the doors throughout treatment, and ease of removal whether we are taking braces off or repositioning brackets in the middle of treatment.

Ease of Bracket Placement

We have been using the Victory Series™ Active Self-Ligating Bracket since March of 2014. From the initial bonding, these brackets have been some of the easiest to bond thanks to the APC™ Adhesive Coated Appliance System. Whether from a doctor’s or a staff’s point of view, this feature makes the bonding appointment flow much more smoothly than having to add adhesive to each bracket individually. The precise amount of adhesive makes for great adaptation of the base to the tooth surface, with minimum cleanup of residual adhesive.

One thing I really like about the packaging of the brackets is that the brackets come with the doors in the “closed” position. This makes it much easier to place the bracket on the tooth and clean the flash from around the edges of the bracket. Our gauge placement is also easily done with the doors closed, as the gauge fits right into the concavity of the bracket door. Also, when bonding the lower arch, it is easy to check the patient’s bite without them biting against the open doors. Our patients also like the fact that the brackets are “sealed” in packets and are being opened for the first time just for their teeth.
Ease of Door Opening and Closing

Opening and closing the doors of Victory Series™ Active SL Brackets seems to be pretty easy over the first 12 months. We really haven’t had any issues with doors getting stuck.

The bracket design allows for easy positioning of the instrument used to open the bracket door. We haven’t noticed any doors getting “loose” either as we have seen with some of the competitive brackets. As patients get further into treatment, we used to notice some doors getting harder to open and close, as calculus can build up around the brackets. So far, this has not been an issue with the Victory Series Active SL Brackets.

Ease of Debonding

Another advantage that we have noticed is the ease of debonding when repositioning brackets. We use both ligature cutters and debonding pliers to debond the brackets. We place the pliers in an occlusal-gingival position and then rock the plier up and down. This procedure allows for easy debonding without deforming the bracket.

With other self-ligating brackets, we would notice that the door mechanism and/or the bracket pad would get deformed in the process of debonding. This ultimately drives up your cost per case as you would have to utilize a new bracket whenever you were repositioning. With the Victory Series Active SL Brackets, they debond just as easily as our normal twin Victory Series™ Brackets, and we are able to reposition them easily.

Overall, we have been really impressed with the Victory Series Active SL Brackets. As with all of the 3M products that we have used, they are engineered with precision and quality. We are excited to have this technology on hand to utilize in treating our patients. Following are images of a patient we are currently treating with Victory Series Active SL Brackets.

Figure 1A-E: Initial bonding.

Figure 2A-E: Progress, 5 Months.

Case photos provided by Dr. Jeffrey A. Housley.
Forsus™ Wire Mount
No Molar Bands Needed!

Now it’s easier than ever to incorporate Forsus™ Class II Correctors, mid-treatment, using the simple-to-use, convenient Forsus™ Wire Mount. Developed with extensive doctor input, the Forsus Wire Mount slides easily onto the archwire to provide stable anchorage for Forsus Correctors, without the need for molar bands.

Features
• Easy to incorporate Class II Correction mid-treatment
• Molar bands no longer required

T-hook design adds stability
For use with Forsus™ Corrector L-pin Modules

Contact your 3M Unitek Representative for more information.

3M™ True Definition Scanner wins Edison Award
Prestigious awards honor outstanding product innovation

Professionals who use the 3M™ True Definition Scanner already know it has game-changing capabilities for a practice. Now, the breakthrough digital scanning device has been recognized by the larger community of inventors. The system was honored with an Edison Award at a ceremony held April 23 in New York City.

The Edison Awards—named for Thomas Alva Edison, whose inventions earned 1,093 U.S. patents—honor excellence in new product and service development, marketing, human-centered design and innovation. Award winners represent “game changing” products and services with innovation centered around four criteria: Concept, Value, Delivery and Impact.
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For more information visit 3MUnitek.Cvent.com/2016summits
Incognito™ Appliance System Courses 2015

Dubai, UAE
May 30-31, 2015
Speaker
Dr. Skander Ellouze
Language
English
Contact
3M Unitek Dubai
Ana Caballero Laporta
+971 43670752
acaballero.laporta@mmm.com
Dr. Mahmoud Soufi
+971 43670666
msoufi@mmm.com

Cologne, Germany
June 19-20, 2015
Speaker
Dr. Esfandiar Modjahedpour
Language
German
Contact
3M Unitek Germany
Brigitte Mader
+49 8191-9474-5015
brigitte.mader@mmm.com

Split, Croatia
June 5-6, 2015
Speaker
Dr. Esfandiar Modjahedpour
Language
English
Contact
Travel Agency Bremen
+385 (0)21 332-500
info@putovanje.hr

Chicago, IL, USA
June 6-7, 2015
Speakers
Dr. David Kemp, Dr. Shane Langley,
Dr. Paul Tran, Dr. Moe Razavi
Language
English
Contact
3M Unitek U.S.
Anh Menard
800-852-1990
almenard@mmm.com

Mexico
October 8-9, 2015
Speaker
Dr. Eduardo Alvarez
Language
Spanish
Contact
3M Unitek Latin America
Jair Lazarin
+52 55 52700 0400 ext. 1422
jlazarin@mmm.com

Huntington Beach, CA, USA
August 29-30, 2015
Speakers
Dr. David Kemp, Dr. Shane Langley, Dr. Paul Tran,
Dr. Moe Razavi, Brandon Edgerton
Language
English
Contact
3M Unitek U.S.
Anh Menard
800-852-1990
almenard@mmm.com

Aesthetics Summits 2015-2016

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Contact
3M Unitek U.S.
Anh Menard
800-852-1990
almenard@mmm.com

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3M Unitek
Clinical Case
Vertical Control Assisted with TADs: A Case Report

Appliances
Straight Wire (Clarity™ ADVANCED Ceramic Brackets)

Diagnosis
- Left mandibular deviation
- Increased lower facial height
- 3 mm gap at rest
- 1 mm superior facial midline deviation
- Convex profile

Smile analysis
- Asymmetric smile
- Low incisor exposure
- 5 + 5 amplitude
- Not harmonic to lower lip

Dr. Laura López Ruiz
3rd year student at Universidad de Murcia.

Dr. María Dolores Campoy
Orthodontic practice at Murcia.

Dr. Pedro Álvarez-Gómez
Orthodontic practice at Murcia and Cartagena.

Figure 1A-F
Orthodontic Perspectives Innova   Clinical Case Studies

Intraoral inspection
• Molar Class III right subdivision
• Cuspid Class III right subdivision
• 0 mm overjet
• 1.5 mm anterior open bite
• Cross bite 13, 14
• 2 mm deviation of the lower mid line regarding the upper

Functional inspection
• When mouth is open, dental mid lines are aligned
• Asymptomatic TMJ

Panoramic X-rays
• Complete dentition
• 18 and 28 blocked
• 48 semi blocked
• Non restorations, cavities or radicular resorption
• Appropriate bone level

Lateral X-rays
• Vertical growth pattern (29.1° Ricketts mandibular plane and 51.1° lower face height)
• Skeletal Class I (2.3 ANB)
• Upper incisor in norm (111° to palatal plane)
• Lower incisor in norm (91.2° IMPA)
• Upper and lower retruded lips
Model analysis
- Light crowding in the upper and lower arch -3.8 and -0.6
- Bolton at bicuspid level, lowers are 4.1 mm larger than they should be

Diagnostic brief
- Good perio health
- 1.5 mm anterior open bite
- Molar Class III right subdivision
- Light crowding
- Skeletal Class I and light vertical pattern

Treatment objectives
- Close the bite and get right function and occlusion
- Leveling and aligning
- Smile aesthetics
- Stability
- Patient satisfaction

Treatment options
1. After explaining to the patient the causes of her condition, a surgical plan was suggested, but the patient rejected this plan.
2. Bicuspid extraction was also discarded due to the risk of increasing the naso-labial angle and flattening the profile. However, extractions remain as an option in case good vertical control is not achieved.
3. We decided to make orthodontic treatment assisted with TADs in the upper arch in order to get effective vertical control of the molars and close the bite. The patient is advised that long-term stability can be compromised.

Treatment plan
Four TADs were placed in the upper arch in order to:
- Have torque control in the posterior segment
- Anchorage
- Close the bite by anterior extrusion and posterior intrusion. Four TADs were placed, two on the vestibular side between first and second molar and two on the palatal side between the second bicuspid and the first molar.
- Class III and open bite correction were achieved with the use of intermaxillary elastics
- Bolton discrepancy was fixed with lower IPR
- The patient demanded to be treated with aesthetic appliances, and therefore, Clarity™ ADVANCED Brackets were selected.
Figure 5A-E

Figure 6A-E

Figure 7A-E

Figure 8A-E
Treatment progress

- Upper braces were bonded including second molars in order to get control over posterior fulcrum. In the same appointment, vestibular and palatal TADs were placed and activated from the beginning with elastic thread in order to avoid molar extrusion and even intrude the posterior segment. For the activation, two lingual buttons were placed on the second bicuspid and first molar. Independently, the vestibular TADs were activated with metal ligature.

Wire sequences for upper and lower arches were different: for the upper arch, the sequence was over expanded .014 CuNiTi, .016, over expanded CuNiTi, .017 X .025 NiTi in the square form and .019 X .025 NiTi in the square form.

For the lower arch, the sequence was .014 NiTi, .016 NiTi in the ovoid shape and a .018 SS with bends.

After four months of treatment, anterior seating elastics were used (3-3, 4). In the lower arch, diastemas were closed using metal ligature.

After 10 months of treatment, vestibular TADs were removed due to mobility. At that time, the overbite was good, however, the palatal TADs remained activated in order to avoid relapse.

Once diastemas were closed, metal ligatures were placed in order to keep the spaces closed and seating elastics were used, on the right one (14-44,45) and the left with a Class II component (23-34, 35).

At 14 months of treatment, we did some IPR in the distal of the 23 and distal of the 42 in order to align the upper and lower midlines.

Final results

At the end of treatment, we achieved correct overjet (1.5 mm) and overbite (2.0 mm). Molar and cuspid Class I in both sides and centered mid lines. In the X-rays we can observe a light retroclination of the lower incisors, but they are within the norm.

Even when our objective with the TADs was to get vertical control and to avoid an increase in open bite, the cephalometric tracings show a significant intrusion of the upper molars that contributes to an anterior mandibular rotation (1.5° decrease in lower facial height), improving the soft tissue profile.

Also, in the smile analysis, we observed harmony between the upper incisors and the lower lip; the patient is satisfied with the outcome.

Regarding the long-term stability, we believe that the upper molars intrusion will contribute to keep the result. However, it will be necessary to follow up and re-evaluate to confirm the result.