A cost-effective and custom solution for bruxism

By Akervall Technologies

In the U.S. alone, bruxism affects 10 per cent of people and as many as 15 per cent of children, according to the American Sleep Association. Once this oral habit has been identified, dentists usually prescribe a night guard or splint. However, many types of night guards exist on the market that do not fit perfectly owing to the hard acrylic material from which they are manufactured. Furthermore, while custom-made occlusal guards are the best permanent solution, not every patient affected by bruxism can afford such an expensive mouthguard. Insurance may cover a night guard only once in the patient’s lifetime. Therefore, many cases of bruxism go untreated, causing continued permanent damage to patients’ teeth.

U.S.-based Akervall Technologies offers an effective custom-made and cheaper solution: the SOVA Night Guard, the thinnest over-the-counter night guard on the market made of thermoplastic material. While the SOVA Night Guard is only 1.6 mm thick, it has been designed to withstand 30 per cent more impact than a conventional mouth guard. Patients have reported that within the first week of wearing the night guard, the pain caused by bruxism or temporomandibular joint dysfunction (TMD) was significantly reduced or stopped. Moreover, they have remarked on SOVA’s stability and thinness, as well as the ease of drinking and talking while wearing it.

The technology behind the SOVA Night Guard is called Diffusix and it works with unique perforations and special crumple zones that prevent grinding forces from travelling to the teeth, relieving pain and reducing the risk of dental injury.

When a SOVA Night Guard is properly fitted, perforations oscillate on impact to diffuse grinding forces and guide those forces into the crumple zones. The perforations also allow for a true custom fit and natural flow of air and saliva. The SOVA Night Guard is made from a tough thermoplastic polymer material with a high tensile strength that is biocompatible, biodegradable and BPA-free.

The night guard starts as a flat horseshoe shape. After immersion in 130°F (54°C) water, the material becomes pliable. The night guard is then molded against the teeth until it hardens. Thus, rather than requiring taking an impression and sending it to the dental laboratory, the SOVA Night Guard can be molded in the office in under 5 minutes to provide the patient with an immediate solution. The appliance can be remolded up to 20 times. SOVA also works with orthodontics. As the teeth are moving, the night guard can be easily adjusted.

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A new era in digital orthodontics

By Jeffrey T. Kozlowski, USA

A true straight-wire appliance would necessitate patient-specific appliances based on an individual’s anatomy. Now, with advances in computer software and digital scanning and fabrication, that idea is a reality and a practical consideration for your practice. Customized Insignia™ is the first true straight-wire appliance. It involves two components: customized appliances—brackets, wires and placement gauges—and 3D real-time virtual treatment planning software. The 3D software enables clinicians to design the patient’s final occlusion on screen before initiating treatment, then prescribes the fabrication of patient-specific appliances to achieve the planned result. This concept is quite different from how clinicians customarily practice orthodontics. Traditionally, we choose appliances with specific torque values to have certain effects, then re-act to those effects by repositioning brackets and making wire bends to guide the teeth into the desired po-sitions. With Insignia, we begin with the end in sight and drive directly to-wards the desired end result.

Over 20 years in development, custom-ized Insignia appliances offer the only comprehensive patient-specific solution available: The treat-ment planning process begins with accurate PVS impressions. New clinical methods and materials make this procedure quick and easy. From the impressions, the pretreatment malocclusion (T1) is digitized into a precise mathematical model of the patient’s skeletal and dental anatomy and the proposed setup (T2) de-signed (Fig. 1a-b).

See Dr. Craig Andreiko’s discussion. The setup is loaded to the Insignia web portal where, used on clinical experience, functional and esthetic preferences and intimate knowledge of the patient’s specific orthodontic needs, the clinician can easily cus-tomize it using the Insignia Approv-er software (Fig. 1c). The included soft-ware offers clinicians unprecedented control in determining accurate tooth position and in their ability to make changes directly to the 3D models without relying on an opera-tor’s interpretation of instructions.

Insignia does not determine treat-ment mechanics nor prescribe tooth movements and it allows clinicians to use the mechanics and adjuncts of their choice. As doctors modify the desired final outcome in the Approv-er software, they can view in “real time” how the changes affect the op-position, occlusion. Once the clinician finalizes the ideal setup, the Insignia software engineers the customized brackets, wires and precision bond-ing placement gauges to the exact prescription required to deliver the desired end result accurately and efficiently.

My experience with Insignia is with both the customized passive self-ligating appliance (Insignia custom SL) and Insignia using stock Damon® System appliances. The Insignia soft-ware can be used to fabricate patient-specific conventional twin brackets and aligners as well. You can also use Insignia software with stock appli-cances (Ortho®, Inspire ICE™ and, as I mentioned, Damon).

Fig. 5. Breakdown of 41 Cases in Clinical Evaluation
Class I – 19 Cases
• 5 were Class I, div 2
• 8 were Class I, div 1 – 13 Cases
Class II, div 2 – 5 Cases
Class III – 6 Cases
• 3 were Class I with Class III tendency
• 3 were Full Class III

The difference between customized Insignia and Insignia using stock brackets is the third-order customi-zation (torque) that is engineered into the customized brackets. This difference saves considerable treat-ment time and effort over using a “best fit torque” stock appliance. Having treated with both custom-ized Insignia SL and Insignia using stock Damon brackets, I can attest to the superior value of the customized appliances.

The Clinical Evaluation
My initial experience with customiz-ated Insignia SL began in 2007 when I conducted an extensive clinical evaluation involving 41 patients to completion. The only limitations on the selection criteria were that patients have no impacted teeth, no pending restorative needs, and must not exhibit poor oral hygiene. The criteria were lim-ited in these ways simply because it wouldn’t have been feasible for me to coordinate the ancillary proce-dures from across the country. At the time, I was in the process of opening my new office in Connecticut and the clinical evaluation was to be conducted at Ormco in Califor-nia—nearly 3000 miles away. For operator consistency, I played the roles of doctor and assistant, per-forming the diagnoses, treatment planning, initial bonding and wire changes, providing all mechanics for 100% of treatment. Full records were taken of each patient, including PVS impressions and iCAT® scans (storing Scans, International, Hatfield, PA) for diagnostics and treatment planning using the Insignia interac-tive Approver software. Based on my previous experience with Damon System appliances, I estimated that treatment time for the 41 patients would average 175 months.

While I wouldn’t recommend select-ing this many patients to begin treat-ing with customized Insignia SL for the first time, I am convinced that the best way to learn Insignia is to submit cases regularly. Regular case submission allows the clinician to relate what is designed in the digital environment to the clinical experi-ence and final results. This positive feedback loop of learning will help the clinician design each successive Insignia case with a higher level of understanding and accuracy and hence be more successful with its application. My experience has been that clinicians who regularly submit Insignia cases are more suc-cessful with it than those who start only a few cases and wait to see how they work out. My skills improved substantially through the first 10 to 20 cases, and like using any new appliance, it takes a bit of time to learn the nuances. I also strongly recommend doctors initially select easier cases, and then add more chal-lenging cases when they become fa-miliar with the software and clinical protocols.

In late February, 2008, in a one-chair operatory at Ormco’s Insignia manufac-turing facility in Glendora, Cali-fornia, I bonded all 41 patients over a five-day period. This intensive week of bonding proved to be my first in-sight into the potential efficiencies of Insignia’s direct view/indirect bonding process. After just the first few patients my bonding technique using the placement gauges sig-nificantly improved and during the balance of the week, the bonding ap-pointments averaged less than one hour, including preparing the teeth, bonding the brackets, placing the turbos, engaging the wires, attaching the elastics and reviewing the clinical results. And all without the help of a clinical assistant! We all know the importance of plac-ing brackets correctly, but few of us can consistently and quickly place each bracket precisely where it needs to be. With Insignia, you design the final occlusion and the customized appliances will be fabricated with custom torques, custom bases (in- out) and custom wires. You specify your bracket positioning preference (e.g., center of the tooth, more gingi-val or more incisal) so that the cus-tom appliances are designed to your specifications, thus, it is possible for your Insignia SL appliances to clini-cally match the placement of your direct bonded appliances.

To transfer the Approver-designed appliances to the mouth, Insignia provides customized placement gauges that place the brackets in the right spot without need for adjust-ment (Fig. 1d). The precision built into the brackets is matched by the ac-curacy of the placement gauges that offer the benefit of a direct view with the precision of planned indirect bonding.

The major challenge in conducting this clinical evaluation was logistics. Managing treatment from so far away was a daunting experience at first; however, the process reinforced the importance of good clinical deci-sion making and its impact on clini-cal efficiency. Gone was the luxury of shortening patients’ appointment intervals to accommodate case management alternatives when we need to make clinical decisions based on how a patient responds. It was thus incumbent upon me to re-create mechanical systems that would withstand the eight- to ten-week ap-pointment cycle of my West Coast trips.

At six months, the first patient fin-ished treatment and by December 2009, after just 21 months, the last patient had his appliances removed. To determine the value of custom-ized Insignia SL for my own practice,
I initially compared the results of this evaluation with my previous seven years of experience treating patients with direct-bonded Damon System appliances. This comparison helped me evaluate customized Insignia SL with what I used to do in my office—direct bonding. These 41 customized Insignia cases treated in an average time of 12.5 months—a full five months (28%) shorter than my estimate of 17.5 months (Fig. 3). I based the estimates on my previous seven years of experience with the Damon System appliance but before I had had any experience with Insignia. In my opinion, this difference alone attests to the efficiency of customized Insignia SL treatment. Another value indicator was the number of reposi-
tionable brackets needed to finish the customized Insignia SL cases, which was 50% less than my cases with direct-bonded stock Damon System appliances.

After completing the evaluation, I compared the results with comparable patients I later treated with Insignia using stock Damon appliances. This second comparison assisted me in placing a value on the patient-spe
cific customized torques of the cus
tomized Insignia SL appliance. The 41 customized Insignia SL cases in the evaluation finished in 22% shorter treatment time (12.5 months) than the next consecutive 41 cases using Insignia with stock Damon brackets that I treated in my private practice (16.1 months). The average number of appointments for the 41 Insignia stock Damon cases was 10.2 versus 8 appointments for the 41 customized Insignia SL cases.

In terms of quality, a subjective evaluation I grant you, I feel that my customized Insignia SL cases finish with quality that equals or exceeds my direct-bonded Damon System cases or my Insignia cases using stock Damon brackets yet in less time and with significantly less effort. I have felt confident enough with the customized Insignia case results to have shown them in presen-
tations around the world and have been so pleased with the results that I now treat 70% of my patients with direct-
bonded stock Damon appliances, primarily those who start treatment in late mixed dentition, but for all those cases for which customized Insignia SL applies, it is now my ap-
pliances of choice.

This article highlights a few of the pa-
tients I treated in the clinical evalu-
ation, demonstrating the quality of the results and efficiency of treat-
ment.
Orthodontic supplies market: Report predicts highest growth rate in Asia Pacific

By DTI

PUNE, India: While North America and Europe are expected to have accounted for the largest share of the regional segments in the global orthodontic supplies market in 2016, the Asia-Pacific market is projected to register the highest growth rate over the next five years, a new report by market specialist MarketsandMarkets has found.

According to the research firm, the forces driving this development are growing efforts to increase awareness of advanced orthodontic treatments in the region and a very large patient population with malocclusion and jaw disorders. In addition, growth is being stimulated through increasing disposable income, coupled with a growing middle class and the stronger focus of global orthodontic and dental companies on emerging Asia-Pacific countries.

According to the market review, the major competitors in the orthodontic supplies segment are 3M, Align Technology, Danaher Corporation, Henry Schein, Dentsply Sirona, American Orthodontics, Rocky Mountain Orthodontics, G&H Orthodontics, Dentsaurum and TP Orthodontics.

The full report, titled Orthodontic Supplies Market by Removable & Fixed Braces (Brackets (Self Ligating, Lingual, Metal, Ceramic, Aesthetic), Archwire (Nickel Titanium, Stainless Steel), Ligature (Elastomeric, Wire), Anchorage Appliances, Adhesives), Patient—Forecast to 2021, can be purchased at the MarketsandMarkets website.

Perfect Orthodontic Performance

POP expansion screws

By Leone S.p.A.

The innovative and biomechanical orthodontic expansion screw POP is made of stainless steel and biomedical techno polymer. The male screw is not in contact with the orthodontic acrylic resin; the function of the screw will not be influenced by the quality of the technical procedure and a non-compliant curing time.

Continuous expansion movement: the high pressure injection of the polymer allows the perfect copy of the male thread of the screw, thus ensuring a steady expansion transmission without the risk of undesired turning back in the mouth. The self-centring rectangular guides ensure a biomechanical and absolutely controlled symmetrical expansion. The flat shape of the guides and their flexibility allow the gradual release of the expansion with a physiological orthodontic movement. The flexibility of the screw allows the adjustments of any dental regrass due to inconsistent use of the appliance by the patient, thus being very effective with holding devices following a rapid expansion treatment.

The high adaptability of the appliance enables a comfortable application in the mouth in the days following reactivation. Two embossed arrows on the body indicate the direction of opening. When using a colour of acrylic resin similar to the polymer body, a white arrow provided with the plastic placement tab may be easily applied to make the direction of activation visible.

The placement plastic tab, made of two pieces combined with a unique geometry, allows perfect protection of the holes from the acrylic resin during the packing procedure and facilitates the removal after the curing cycle. The screw body is available in five colours.

According to the market review, the fixed braces segment is expected to have gained the largest share in the global orthodontic supplies market in 2016.

(Photograph: bngdesigns/PixaBay)