Implants featured at Chicago Midwinter

Hundreds of companies, including a bevy of implant companies, headed to the Chicago Midwinter Meeting to present the latest and greatest in products and technology. Nearly 30,000 dentists, hygienists, dental students and others attended the 148th annual meeting, presented by the Chicago Dental Society, at the McCormick Place West Building in Chicago.

The next Chicago Midwinter Meeting will take place Feb 20-22, 2014. Mark your calendars now!

For more photos, see page B8.

Annual February show is a must for launching new products in the dental implant industry

Using SonicPin Rx

Dissolving the need for metal fixation screws in implant site development

By Lewis Cummings, DDS, MS

In this ever evolving age of dental technology, the practice area of implant site development has benefited from a technologic innovation and a new era of resorbable fixation devices and membranes. Traditionally, various metal fixation screws have been utilized for stabilization with the primary drawback being the need for eventual reentry for removal. Now, the necessitation of fixation device removal has been eliminated with the introduction of the SonicWeld Rx™ system of resorbable fixation devices and membranes.

A 42-year-old male presented with a significant buccal osseous defect resulting from the long-standing loss of the maxillary right premolar (Fig. 1). A single tooth implant-supported restoration was planned.

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as the final prosthesis. Given the volume of bone loss in the first premolar site and the desire to minimize post-operative morbidity, an allogenic block bone graft was chosen for defect regeneration.

Though the predictability of allogenic block graft material is well-documented, complete graft immobilization is imperative for success.1

The SonicWeld Rx process of onlay block graft fixation utilizes an ultrasonic vibrating handpiece to deliver a polymer pin through the graft and into the host bone. The SonicPin Rx travels into a specially prepared hole with variable diameters, similar to a lag method.

The SonicPin Rx is designed to engage a minimum of 5 mm of host bone at its tip. The final length determination of the pin is an addition of this length plus the graft thickness. Given this consideration, the typical SonicPin Rx clinical length is 9 or 11 mm and the diameter is 2.1 mm (Fig. 3).

For bone fixation, a specially designed drill is utilized to prepare an insertion site through the onlay graft and into the host bone. The SonicPin Rx is then loaded onto the sonic handpiece tip and inserted into the preparation without sonic activation. The pin should advance passively through the graft portion until engaging host bone at the distal aspect of the preparation. This distal portion has a special geometry allowing the tip of the pin to be seated snugly prior to activation of the welder. Once seated, forward orthogonal pressure is placed on the SonicPin Rx and the SonicWelder is activated, initiating sonic vibrations that travel down the shaft of the pin, ultimately creating friction heat against the bone at the site of bone-pin contact. The user translates a consistent level of energy with steady forward orthogonal pressure on the SonicPin Rx post activation to achieve final bone-bone contact.

Fig. 3a: Pre-operative photo of ridge defect.

Photos/Provided by Dr. Lewis Cummings

Fig. 3b: Without temp.

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**SONICPIN, Page B6**
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forward pressure on the handpiece before and during the activation. Within moments of activation, the outer surface of the SonicPin Rx liquefies, leading to a narrowing of the shaft that allows for subsequent insertion into the full depth of the pilot hole. Ultimately, the larger head of the SonicPin Rx partially inserts into the narrower proximal hole, forcing polymer into this external bony wall as well. Once fully seated, the SonicWelder is deactivated and removed from the pin after a brief cooling period.

The SonicWeld Rx process is based on the effect of vibratory frictional heat on the thermoplastic polymer shaft of the SonicPin Rx, leading to pin liquefication. This transformation allows for the subsequent engagement of the liquefying pin into the ever-narrowing recipient preparation. A minimal elevation in temperature is created, but only for very short periods of time where the two hard surfaces are in contact. Though the friction of the ultrasonic vibration translated to the SonicPin Rx...
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is adequate to melt the outer polymeric core. Histologic evaluation has shown no damage to the receiving bony structures. For this case, local anesthetic was administered and removal of the temporary prosthesis was performed to allow access to the site through a traditional full-thickness mucoperiosteal flap on the buccal. Using rotary instruments, an aggressive slot preparation was created in the deficient first premolar site for recontouring of the allogenic-bone block graft (Fig. 2).

Following rehydration of the graft and application of platelet-rich plasma, the graft was inserted into the recipient preparation. To eliminate micro-movement of the graft during integration, dual-point fixation was utilized from the graft into the host bone. Two 2.1 x 11 mm SonicPin Rxs were placed using the SonicWeld Rx protocol (Fig. 4).

Once the block graft was stabilized, containment and augmentation of the overlying gingiva. Complete and passive site closure was obtained using a combination of 4.0 PTFE and 6.0 polypropylene sutures (Fig. 6). A traditional post-surgical protocol was followed for seven days consisting of anti-inflammatory and antibacterial agents, with the patient being instructed not to masticate in the area.

Following four months of uneventful healing (Fig. 7, 8), the site was re-entered for implant placement. At this time, the block bone graft was clinically well-integrated with the host bone and no signs of mobility were detected (Fig. 9). Minimal access was necessary at the re-entry as the fixation pins did not have to be removed. An implant osteotomy was prepared to receive a 3.8 x 12 mm BioHorizons® Tapered Internal Hex Implant with the Laser-Lok® surface (Fig. 10). Following insertion, the cover screw was placed, the site was closed with absorbable suture, and the temporary restoration was replaced.

After an additional four months to allow for proper implant integration, the healing abutment was placed, and the final restoration was fabricated. The SonicPin Rx system was chosen for fixation in the case to eliminate the need for a subsequent site reentry for screw retrieval. It stays strong while the bone heals, it then loses strength and resorbs, which results in less risk and more benefit for both the patient and the dentist.

**References**

2) KLS Martin Group. Insert SonicPins Rx.

**About the author**

Lewis Cummings, DDS, MS, received his dental degree from the University of Texas Health Science Center at San Antonio. He did his residency at the University of Nebraska Medical Center in Lincoln, where he completed a master’s degree in oral biology and received his certificate in periodontics. While in Lincoln, Cummings began to research tissue engineering and has since lectured internationally on the topic. Currently, he holds associate professor positions with both the University of Texas Dental School at Houston and the University of Nebraska Medical Center in Lincoln, teaching soft-tissue grafting and dental implants in the postgraduate programs. He is also an instructor with the Center for Advanced Dental Education in Dallas and the Rocky Mountain Dental Institute in Denver.