

John Ley, DDS, Editor

ENDOSSEOUS IMPLANTS

"Which Surface Properties Enhance Bone Response to Implants? Comparison of Oxidized Magnesium, TiUnite, and Osseotite Implant Surfaces," by Y.T. Sul, C. Johansson, T. Albrektsson. *Int J Prosthodont*, 19:319-329, 2006.

This paper compared the osseointegration of different implant surfaces in a rabbit model. Three screw-shaped titanium implants were studied: an experimental implant with an oxidized magnesium (Mg) surface, the TiUnite implant (Nobel Biocare), and the Osseotite implant (3i). Twenty of each type of implant were inserted into the tibia of 10 rabbits. Two healing periods were allowed: 3 and 6 weeks. At completion of the healing period the animals were sacrificed and the osseointegration was evaluated by removal torque testing and evaluating the bone-implant interface by histomorphometry. The results indicated that at 3 and 6 weeks the Mg implants had significantly greater removal torque and bone growth compared with the Osseotite implants. There was no significant difference comparing the TiUnite and Mg implants. The TiUnite implants had significantly greater removal torque compared with the Osseotite implants at 6 weeks but not at 3 weeks. Preoperatively, the surface morphology of the implants was compared. The surface roughness of the Mg implants was similar to the Osseotite implants. The TiUnite implants' surface roughness was greater than the other 2 implant types, and this was postulated to aid in osseointegration. The conclusion of this paper was that the rough surface of the

TiUnite implants enhanced osseointegration compared with the Osseotite implants. Despite their smoother surface compared with the TiUnite implants, the Mg implants' surface chemistry aided in bone formation.

"Plunging Ranula Formation as a Complication of Dental Implant Surgery: A Case Report," by W. Loney, S. Termini, J. Sisto. *J Oral Maxillofac Surg*, 64:1204-1208, 2006.

This paper describes a complication that arose from an improperly placed implant. A 44-year-old woman was examined for a progressively enlarging swelling of the left sublingual and submandibular spaces. She had 2 root form implants placed 6 months previously in the left mandibular second premolar and first molar sites. Within 1 week of implant placement, she developed sublingual swelling that did not respond to antibiotic therapy. The premolar implant was removed at that time. The swelling continued to increase and migrated into the submandibular space. At 5 months postplacement, the patient visited the authors and was sent for magnetic resonance imaging and computerized tomography, which suggested a plunging ranula. She was treated successfully with excision of the left submandibular gland and excision of the ranulas fibrous capsule. The authors stated that the ranula formation was due to perforation of the lingual bone at the time of implant placement with resultant soft tissue injury.

"Implant Survival Rates for Oral and Maxillofacial Surgery Residents: A Retrospective Analysis

of Resident Level of Training on Implant Survival," by M. Melo, H. Shafie, G. Obeid. *J Oral Maxillofac Surg*, 64:1185-1189, 2006.

This paper compared the level of experience of oral surgery residents with implant survival rates. The study evaluated 175 implants placed in 54 patients over a defined period during an oral surgery residency. The implants were placed in a 2-stage fashion and were followed at set intervals. The implants were evaluated for success with both clinical and radiographic criteria. The success rates were tabulated for each year of training of the resident surgeon (from 1 to 4 years). The results indicated no difference in the success rates, and the success rates were comparable with those found in the literature. These results suggest that level of training (experience) does not affect implant survival rates.

"Bone Tissue Formation Adjacent to Implants Placed in Fresh Extraction Sockets: An Experimental Study in Dogs," by D. Botticelli, L. Persson, J. Lidhe, T. Berglundh. *Clin Oral Implants Res*, 17:351-358, 2006.

This study evaluated bone healing adjacent to implants placed in both artificially created defects and fresh extraction sites. Six dogs had their first and second premolars and first molars extracted bilaterally. After 3 months of healing, the right side was treated as follows. Implants were placed into the healed ridge sites that had osteotomies created with a residual defect 5 mm deep and up to 1 mm wide at the crestal portion of the implant (A sites).

On the same side the third and fourth premolars were extracted, and implants were placed into the distal socket of each tooth such that a residual defect of 1 mm was present between the implant and the socket (N sites). Abutments were placed on all implants, and flaps were sutured. After an additional 2 months of healing, an identical procedure was performed on the left side. After 2 more months of healing, the dogs were killed and their jaws were removed for analysis. The results indicated that at 2 months of healing there was bone fill into the apical portion of the defects. At 4 months of healing more crestal bone fill was present. When comparing the naturally created defects (N sites) with the artificial defects (A sites), there was a distinct difference between the 2 groups: the N sites had significant crestal bone resorption, and the A sites had almost complete bone fill of the defects. These results suggest that the bone heals differently adjacent to implants placed into similar-sized defects in healed edentulous ridges and fresh extraction sockets. Implants placed into extraction sockets experienced significant crestal bone loss.

IMPLANT PROSTHODONTICS

"Peri-implant Soft Tissue Health Surrounding Cement and Screw-Retained Implant Restorations: A Multicenter, 3-Year Prospective Study," by H. Weber, D. Kim, M. Ng, J. Hwang, J. Fiorellini. *Clin Oral Implants Res*, 17:375–379, 2006.

This prospective study examined the peri-implant health of both screw-retained and cement-retained prostheses. One hundred fifty-two ITI implants (Strau-

mann, Waldenburg, Switzerland) were placed into the anterior maxilla of 80 patients in a 1-stage fashion. Porcelain fused to metal crowns and bridges were attached 3 to 5 months after implant placement: 61.9% were screw retained and 38.1% were cement retained. The clinical gingival health and esthetics of the restorations were recorded at defined intervals up to 36 months postloading. The results indicated that the screw-retained crowns had a more favorable gingival health over time. There was no soft tissue recession during the study, and patients did not have a preference for a particular prosthesis type from an esthetic standpoint. These results suggest that screw-retained crowns may offer improved peri-implant soft tissue health compared with their cement-retained counterparts.

BONE GRAFTING

"The Bone Regenerative Effect of Platelet-Rich Plasma in Combination With an Osteoconductive Material in Rat Cranial Defects," by A. Plachokova, J. van den Dolder, P. Stoeltinga, J. Jansen. *Clin Oral Implants Res*, 17:305–311, 2006.

This study examined the efficacy of adding platelet-rich plasma (PRP) to osteoconductive graft materials in a rat model. Thirty-eight rats had cranial defects grafted with a mixture of hydroxyapatite/ β -tricalcium phosphate (60/40) alone or mixed with PRP in a liquid or gel state. Eight cranial defects were left ungrafted. The rats were killed after 4 weeks of healing and the defects were examined radiographically, histologically, and by histomorphometry. The results indicated similar bone growth

in all 3 experimental groups. The authors concluded that PRP had no beneficial effects on bone formation in this animal model.

"Influence of Platelet-Rich Plasma on a Bioglass and Autogenous Bone in Sinus Augmentation: An Exploratory Study," by B. Klongnoi, S. Rupprecht, S. Kessler, et al. *Clin Oral Implants Res*, 17:312–320, 2006.

This paper examined the effect platelet-rich plasma (PRP) had on the osseointegration of dental implants in grafted sinuses. The study used minipigs who had their premolars extracted bilaterally. After 2 months of healing, the animals underwent bilateral sinus augmentation and simultaneous implant placement. The sinuses were grafted with autogenous bone alone (group A), autogenous bone plus PRP (group B), Biogran alone (Orthovita, Implant Innovations, Palm Beach, Fla) (group C), or Biogran plus PRP (group D). Any sinus membrane perforations were repaired with a bovine collagen sponge. The animals were sacrificed at 1, 2, 8, and 12 months after implant placement. In the latter 2 time frames, the implants were uncovered 6 months post-placement, and healing abutments were placed to allow functional loading for 2 to 6 months. The bone-implant contact was established with the use of microradiography. Histologic assessment of the bone was also conducted. The results indicated that the autogenous bone groups (A and B) had greater bone-implant contact compared with the Biogran groups (C and D). The addition of PRP did not significantly affect the levels of bone-to-implant contact.