

John Ley, DDS, Editor

REVIEWS

“A new retrieval system for cement-retained implant superstructures: A technical report” by Ichikawa T, Ishida O, Watanabe M, et al. J Prosth. 2008;17:487–489.

This describes two techniques to improve retrievability of cement retained implant prostheses. The first employs the use of a lingual screw(s) set at an oblique angle to the underlying abutment. The screw does not engage the abutment. The prosthesis cemented with temporary cement. The prosthesis is removed by turning the screw clockwise. This will engage the screw with the abutment and lift the prosthesis of the abutment. The second system involves placing a small vent hole in the prosthesis which lines up with a small dimple placed in the underlying abutment. The prosthesis is luted with temporary cement. If removal of the prosthesis is desired an instrument is placed into the superstructure and engages the dimple. The instrument is then rotated in an occlusal direction levering the prosthesis off the abutment.

“Complications of computer-aided-design/computer-aided-machining-guided (NobelGuide) surgical implant placement: An evaluation of early clinical results” Yong LT, Moy P. Clinical Impl Dent Related Res. 2008;10:123–127.

This paper describes complications encountered when employing a CAD/CAM (computer-aided-design/Computer-aided-machining) system for implant placement and immediate loading of dental implants (NobelGuide, Nobel Biocare, Yorba Linda, CA, USA). Thirteen patients (78 implants) were treated using the system over a 3 and a half-year period. The cases were treated by the same surgeon/prosthodontist. All implants were placed in a flapless manner using the CAD/CAM guide. All prostheses were delivered after surgery having been previously prefabricated by the same CAD/CAM system. The complications were grouped into early and late, surgical and prosthetic. There were three early surgical complications. One was incomplete placement of the implant to the desired depth that would have prevented seating of the prosthesis. This implant was removed immediately and counted as a failure. The other two were bony protuberances that prevented prosthesis seating. The early prosthetic complications included prosthesis loosening, speech problems and cheek biting. The late surgical complications included persistent pain in one patient and residual buccal soft tissue defect in another. There

were seven late implant failures. The total implant failure rate was 9%. The majority of the implants that failed were longer than 10 mm in length. This was attributed to difficulty getting coolant to the deeper implant osteotomies due to the NobelGuide device. The late prosthetic complications included heavy occlusal wear (2), screw loosening (2) and prosthesis fracture (3). One patient was unhappy with the aesthetics and one had pain on chewing. The majority of the complications were on carbon fiber frameworks.

“The hydroxylapatite-bone interface: 10 years after implant installation” Beekmans H, Meijer G, Barkhuysen R, et al. Int J Oral Maxillofac Surg, 2008,37: 768–772.

This paper describes the post mortem analysis of a successfully integrated hydroxylapatite (HA) coated implants. The patient had HA coated IMZ implants (Dentsply Friadent, Mannheim, Germany) placed into previously grafted maxillary sinuses (grafted with a mixture of autogenous bone and HA granules) 10 years earlier. After 10 years of function (supporting an implant overdenture), the patient died of natural causes. The bone-implant complex was retrieved from the patient and subjected to analysis. The results demonstrated that clinically the implants were well integrated with no peri-implant disease. The grafted bone demonstrated 48% volume of trabecular bone, 14% volume of HA granules and 38% empty space. The implants had their HA coating intact, with a mean thickness of 68 μm , indicating that 68% of the original coating was present. The implant-bone contact was 47%. There were no multinucleated giant cells seen. These results demonstrate that these implants integrated well with the grafted bone and the HA coating was also intact with the underlying implant surface.

“Comparative study of wide-diameter implants placed after dental extraction and implants positioned in mature bone for molar replacement” Penarrocha-Diago M, Carrillo-Garcia C, Boronat-Lopez A, Garcia-Mira B. Int J Oral Maxillofac Impl. 2008;23:497–501.

This retrospective study compared the results of placing wide diameter implants into fresh extraction sites versus intact bone for molar replacement. The study included 162 implants placed in 100 patients placed and loaded over a two-year period. All implants were wide diameter (5.5 mm) in the molar region with lengths varying from 8 to 13 mm. The implants were

either placed at the time of extraction ($n = 32$) or after at least 6 months healing post-extraction ($n = 130$). Gaps surrounding the immediate implants were grafted with bone collected during implant site preparation. Healing periods prior restoration was 8 weeks in the maxilla and 6 weeks in the mandible. The prostheses varied from single teeth, fixed partial dentures, overdentures and fixed full dentures. The opposing dentition varied from fixed to removable with the majority being natural dentition. The implants/prostheses were followed radiographically and clinically pre and post-loading (12 months follow-up). Established criteria for failure were employed. The results indicated that 4 implants failed all in the non-immediate group. There was no significant difference between the two groups comparing failure and crestal bone loss. There was no statistical correlation between failure and implant length, patient smoking status and oral hygiene. These results suggest that wide diameter implants placed in immediate extraction sites of molars have the same success rate as those placed in healed mature bone.

“Histologic evaluation of socket augmentation with mineralized human allograft” Wang H-L, Tsao Y-P. Int J Periodontics Restorative Dent. 2008;28:231–237.

This paper studied the bone regenerated in sockets grafted with a mineralized cancellous allograft, Puros (Zimmer Dental, Carlsbad, CA, USA). The study consisted of 5 patients who had seven teeth extracted. All teeth were extracted in an atraumatic fashion. Subsequently, the internal socket walls were perforated and the graft material was densely condensed up to 2 mm apical to the soft tissue margins. The graft was then covered with Colla-Plug (Zimmer Dental) and then closed with cross mattress sutures. The sockets were left to heal for 5 to 6 months prior to implant placement. At the time of implant placement, the grafted material was retrieved using a 2×10 mm

trephine drill. Histologic and histomorphometric analysis was then performed. The results indicated that all sockets healed uneventfully. Soft tissue coverage of the graft was complete by 6 weeks in all patients. At implant placement good bone fill was noted in all sockets and was deemed to be D1 to D2 density. Microscopically, the bone cores demonstrated good bone replacement of the graft with denser bone in the apical regions. The graft remaining was not primarily in the coronal portion of the sockets. No inflammation was noted. This study demonstrated the use of Puros as a socket graft material. Further study is warranted.

“Evaluation of bone tissue integration of pure and alloyed titanium implants” Stenport V, Johansson C. Clin Impl Dent Rel Res. 2008;10:192–198.

This animal study evaluated the integration of commercially pure (CP) and alloyed (6% aluminum and 4% vanadium) (Ti-6-Al-4V) titanium implants. A total of 40 screw shaped implants (20 from each group) were placed into the femurs and tibiae of 5 rabbits. Topographical analysis of 3 implants from each group was performed. After 16 weeks the rabbits were killed and the implant/bone complexes harvested for analysis. Biomechanical integration was assessed with the use of resonance frequency analysis (RFA) and removal torque testing (RTQ). Then histomorphometric and histologic analysis was performed. The results indicated that both implants were similarly rough. There was no difference between the implants with the RFA test. The RTQ test showed the CP implants to be significantly higher than the alloy implants. Histologic and histomorphometric analysis did not demonstrate a significant difference between the two implant types. These results suggest that the CP and Ti alloy implants integrate in a similar fashion but the RTQ test suggests that the CP implants may have a different bone-implant interface attachment. Further study is needed.