What's New in Dentistry

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Platelet-rich plasma (PRP) accelerates alveolar repair process. Bone grafting is often required prior to placement of dental implants in deficient alveolar ridges. In some cases, allografts are necessary, such as Bio-Oss. This material is a sterilized and deproteinized bovine bone product. It has been shown to be highly biocompatible. But this material eventually needs to be replaced by the host bone. Platelet-rich plasma is an autogenous modification of fibrin adhesive. Platelets contain important growth factors that, when secreted, are responsible for increasing cellular mitosis and inducing cellular differentiation. These factors are of fundamental importance in initial wound healing. Would PRP have a positive effect in enhancing the repair process when Bio-Oss is used to augment alveolar ridges? A study published in the *International Journal of Oral and Maxillofacial Implants* (2009;24:432–438), evaluated the qualitative effectiveness of PRP in the process of new bone formation when associated with biomaterials. This study was performed on experimental animals. The first, second, and third premolars were extracted. Then, the extraction sockets on one side of each animal where either allowed to heal without grafting material or had the addition of Bio-Oss. On the contralateral side of each mandible, PRP was added to either the control socket or those that had been filled with Bio-Oss. Then, the authors monitored the healing process and after 30 days, compared the histologic outcome of adding the platelet-rich plasma on the alveolar healing process. At 30 days, the control sockets where still empty indicating that no repair process had begun. In the Bio-Oss sites, a large quantity of the particles had not started reabsorption. However, on the side where PRP had been added to the non-grafted sockets, there was a large quantity of blood vessels, indicating angiogenesis and no remains of periodontal ligament tissue were observed. In the site that received the Bio-Oss plus PRP, there was the characteristic primary bone tissue formation, with a large quantity of osteocytes per unit area. The authors concluded that the addition of PRP appears to accelerate the alveolar repair process.

Prevalence of implant loss. Dental implant insertion is an accepted treatment for missing teeth. As a result, patients and dentists have high expectations for successful esthetic and functional results. However, potential risk factors as well as local factors can negatively influence implant survival. A study published in the *Journal of Periodontology* (2009;80:1069–1075) evaluated the prevalence of implant loss and what specific factors are implicated with implant failure. The sample for this study consisted of subjects who had had implants placed between 1990 and 2005 at the University of Oslo. A total of 109 volunteers were available for re-examination. The study population included 69 females and 40 males with a mean age of 43 years at the time of implant insertion. The average time from implant loading to re-examination was 8.4 years. The subjects were examined clinically and interviewed regarding their general health and habits. A total of 374 implants had been placed in these subjects. Out of this total, 18 implants (4.8%) were lost in 10 subjects. Eleven implants were lost before loading, three were lost during the first 5 years after loading, and four were lost 5 to 10 years after loading. No implants were lost after over 10 years of loading. The authors found that the loss of oral implants was significantly associated with a history of smoking and periodontitis. The authors conclude that dental implants show a high survival rate, and that implant loss was significantly associated with smoking and periodontitis.

Surface treatment and implant stability. Although titanium implants are successful, different implant surface topographies have been developed. Surface modifications to implants may accelerate implant incorporation and improve bone formation. Therefore, long-term investigations are needed to prove the clinical acceptability of an implant surface. Some examples of implant surfaces that have been used for several years are titanium plasma-sprayed, sand blasted/acid-etched, and hydroxyapatite-coated. A study published in the *International Journal of Oral and Maxillofacial Implants* (2009;24:289–298), compared the removal torque and the influence of controlled functional loading of implants with different surface treatments. This study was performed on experimental animals. A total of 180 implants were placed in the mandibles of 18 animals. Different implant surfaces were evaluated and included a smooth titanium surface, a titanium plasma-sprayed

surface, a sandblasted/acid etched surface, and a hydroxyapatite-coated surface. Mandibular premolars were extracted followed by a 3-month healing period. Then implants with different surface treatments were inserted into each of the animals. Three months after implant placement, all the implants were uncovered. Torque resistance measurements were performed to evaluate osseointegration. The first removal torque measurements were performed on seven implants of each surface structure, and these were selected arbitrarily from a portion of the implants. The remaining implants were divided into two groups and either loaded or remained unloaded. Then the removal torque values were evaluated at 6 and 9 months later. The authors found that all smooth-surface implants eventually failed. A significant increase in removal torque resistance was found for the loaded plasma-sprayed implants. The unloaded acid-etched and plasma-sprayed implants showed no change in removal torque levels after the closed healing period. The authors conclude that successful osseointegration was achieved with acid-etched, plasma-sprayed, and hydroxyapatite-coated implants.

Ultrathin arthroscopy for treating closed-lock. Closed-lock of the temporomandibular joint results in mouth opening limitation and in the past has been considered the result of a deformed and displaced temporomandibular disc. However, with advanced imaging techniques, many related conditions have been shown to produce closed-lock. For example fibrous adhesions can form and increase the friction between disc and bone during mouth opening. Options for treating closed lock are physical therapy, medication, superior joint space injection, and arthrocentesis. Another method is the application of TMJ lysis and lavage, in order to remove the inflammation products and release the tissue adhesions. A study published in the *Journal of Oral and Maxillofacial Surgery* (2009;67:1039–1045), evaluated the outcome of TMJ lysis and lavage using ultrathin arthroscopy on a sample of 15 subjects with closed-lock of the temporomandibular joint. In order to document the effectiveness of this procedure, the maximum mouth opening of each subject was done by measuring the interincisal distance. A visual analog scale was used to determine the patients' subjective pain. The results show that out of the 15 subjects, 14 of these showed improvement of mouth opening of more than 5 mms. The pain upon opening was reduced more than 60%. Based upon their data, the authors conclude that TMJ lysis and lavage using ultrathin TMJ arthroscopy could be considered as a reasonable treatment for the closed-lock patient.

Influence of platform-switching on implant crestal bone loss. Crestal bone loss adjacent to the platform of a dental implant occurs routinely after implant uncovering and restoration. The main factors that have been hypothesized to be involved in this process of bone loss include surgical trauma to the periosteum and bone, biomechanical imbalance related to loading, the size of the microgap between the implant and the abutment, and bacterial colonization of the implant sulcus. Can this loss of crestal bone adjacent to the implant platform be avoided? In recent years clinicians have noted that restoring the submerged implant with an abutment that had a smaller diameter than the implant resulted in less crestal bone loss. This process became known as platform-switching. Now implants are designed purposely to include this concept in the implant shape. But does platform-switching really work? A study published in the *International Journal of Oral and Maxillofacial Implants* (2009;24:299–308) evaluated this question. This randomized prospective clinical study included 60 subjects that were treated at 12 different professional dental centers. The subjects were randomly assigned to receive either platform-enlarged or control cylindric implants using three different surgical procedures: conventional nonsubmerged, submerged, and submerged implants with a reduced abutment. The primary outcome measure was the change in crestal bone level assessed radiographically after 12 and 24 months from implant placement. The authors found that all submerged and 92% of nonsubmerged platform-enlarged implants exhibited no bone loss. On the other hand, control implants with an abutment as large as the implant platform exhibited more bone loss than their platform-enlarged counterparts or control implants with a reduced abutment. The authors conclude that use of implants with an enlarged platform can result in better preservation of crestal bone.