Abstracts of articles published in important Implantology, Prosthodontics and Periodontics journals from around the world

Periodontitis, implant loss and peri-implantitis. A meta-analysis.

Sgolastra F, Petrucci A, Severino M, Gatto R, Monaco A. Clin Oral Implants Res. 2013 Dec 31.

Objective: The aim of the present systematic review and meta-analysis was to assess the role of periodontal disease as a risk factor for implant loss, peri-implantitis and implant-bone loss. *Material and Methods:* Six electronic database and a manual search resulted in 7391 unique publications; after selection only 16 studies were included in systematic review. Dichotomous data were expressed as risk ratio (RR) and 95% confidence interval (CI), while continuous data were expressed as standardized mean difference (SMD). Due to the expected inter-study heterogeneity, a random effect model was used for both type of data. The pooled effect was considered significant for a $P < 0.05$. *Results:* Meta-analysis revealed that a higher and significant risk for implant loss was present in patients affected by PD (RR: 1.69, 95% CI: 1.31-2.17, $P < 0.0001$). A higher and significant IBL was present in patients with periodontal disease, when compared with patients periodontally healthy (SMD: 0.38, 95% CI: 0.18-0.58, $P = 0.0002$). Patients periodontally compromised showed an increased risk of PI, when compared with patients without periodontitis (RR: 2.17, 95% CI: 1.51-3.12, $P < 0.0001$) No evidence of significant heterogeneity was detected for the three outcomes. *Conclusion:* Strong evidence suggests that periodontitis is a risk factor for implant loss; moderate evidence revealed that periodontitis is a risk factor for peri-implantitis and that patients with periodontitis have higher implant-bone loss.

Clinical and radiographic evaluation of narrow- vs. regular-diameter dental implants: a 3-year follow-up. A retrospective study.

Zweers J, van Doornik A, Hogendorf EAH, Quirynen M, Van der Weijden GA. Clin Oral Impl Res. Published online: 20/12/2013.

Objectives: Narrow-diameter implants (NDIs) are used in severely resorbed mandibles. The reduced implant diameter means a reduction in the total contact surface between the implant and bone. The question arises whether the implant can be sufficiently osseointegrated to withstand loading forces. If not, marginal bone loss can result from overload. The aim of this retrospective study was to compare clinical and radiographic measurements and patient satisfaction of NDIs with those of regular-diameter implants (RDIs) placed in edentulous patients to support an overdenture via either a ball or a locator connection. *Material and Methods:* Retrospectively over a 7-year period, a total 119 patients fulfilled the inclusion criteria and were selected for this study. The patients received two 3.3- or 4.1-mm-diameter standard titanium implants in the mandible to support an overdenture. At maintenance examinations after 1 and 3 years, clinical peri-implant and prosthetic conditions, marginal bone (MB) and patient satisfaction were investigated. *Results:* None of the 238 implants were lost during the 3-year follow-up period. Overall MB loss was statistically higher in the NDI group when compared with the RDI group. At the site level, a greater MB loss was observed at the distal side of both implant types. Implants with a locator showed significantly greater MB loss (0.38 mm) compared with the implants with a ball attachment (0.14 mm) over the two-year evaluation period (P = 0.006). Patient satisfaction significantly favoured the NDI (8.3) and the locator attachment (8.6). *Conclusions:* The results suggest that during the first three years after implantation, NDIs were associated with more marginal bone loss compared with RDIs. Regardless of implant diameter, the locator attachment showed more marginal bone loss over time compared with the ball attachment.

Loss of pulp vitality after maxillary sinus augmentation: a surgical and endodontic approach.

Romanos GE, Papadimitriou DE, Hoyo MJ, Caton JG. J Periodontol. 2014 Jan;85(1):43-9.

Background: Maxillary sinus augmentation is a routine procedure performed in implant Dentistry in cases with sinus pneumatization. This study presents a series of clinical cases in which tooth devitalization occurred in conjunction with sinus augmentation. *Methods:* In the three cases presented, a sinus-lift procedure was performed that resulted in devitalization of the adjacent teeth. Patients were referred to an endodontist for evaluation and treatment. Vitality of the teeth was determined by the use of a cold test, electric pulp test, and cavity test. The pulp was considered to be necrotic if the tests were negative. *Results:* In this case series, loss of pulp vitality of two maxillary left second premolars and one maxillary left first molar occurs after sinus-augmentation procedures. The devitalized teeth were free of caries. In one case, two amalgam restorations were present. *Conclusion:* Pulp necrosis may occur in conjunction with a sinus-lift procedure in cases when an adjacent root is in close proximity to the sinus floor and the sinus membrane is elevated over the root apex.

Patients' perspectives on dental implant and bone graft surgery: questionnaire -based interview survey.

Hof M, Tepper G, Semo B, Arnhart C, Watzek G, Pommer B. Clin Oral Implants Res. 2014 Jan;25(1):42-5.

Objective: To assess up-to-date expectations and preferences of patients seeking dental implants. *Material and Methods:* One hundred and fifty consecutive patients (66 male and 84 female interviewees) were asked to rank their concerns regarding implant therapy and answer a questionnaire on implant and bone graft surgery, cost and time considerations and second-opinion behaviour. *Results:* Treatment predictability and avoidance of removable dentures were ranked high priority (compared with time and cost efficiency or avoidance of bone grafts). Patients' estimation of the 10-year implant success rate was 84%, and 59% of patients expected implants to last for a lifetime. Total treatment time was estimated to be 4 months on average, and only 12% would tolerate increased risk of implant failure for the sake of shortening treatment duration. 61% of interviewees accepted autologous bone grafts (the majority favouring the retromolar area), while only 23% were willing to undergo bone harvesting from the hip. 43% opted for bone substitute material to avoid donor site morbidity. 67% would accept the additional costs associated with computed tomography, software-based treatment planning and guided implant placement to avoid bone graft surgery. Motivation for second-opinion seeking was high (46-62%), especially in young and male patients. *Conclusion:* Patient expectations on implant success and predictability are high compared with their reluctance towards treatment costs and duration. Acceptance of treatment morbidity is high among patients reporting low denture satisfaction; however, minimally invasive treatment alternatives are generally preferred.

Factors influencing treatment decision -making for maintaining or extracting compromised teeth.

Lang-Hua BH, McGrath CP, Lo EC, Lang NP. Clin Oral Implants Res. 2014 Jan;25(1):59-66.

Objective: To evaluate treatment decision-making with respect to maintaining periodontally compromised teeth among dentists with or without postgraduate qualifications in implant Dentistry. *Material and Methods:* A series of patient scenarios with varying degrees of periodontal disease levels was presented to dental practitioners. Practitioners' decision-making outcome was determined, and intention to retain the compromised teeth was analyzed in bivariate and regression analyses (accounting for postgraduate implant training, gender, years in dental practice, and implant placement experience). *Results:* This study involved 30 dental practitioners with postgraduate implant qualifications (GDPP), 33 dental practitioners without postgraduate implant qualifications (GDP), and 27 practitioners undergoing training for postgraduate implant qualifications (GDPT). Variations in treatment decision-making were evident between the three groups. Differences in treatment approaches to retaining compromised teeth were apparent. Furthermore, variations in rehabilitation of extracted scenarios existed in terms of use of implant and number of implants need for rehabilitation. Accounting for dentist and practice factors in regression analyses, GDPP/GDPT were three times

as likely to retain periodontally compromised upper molar, with or without pain, compared to GDP (without pain OR 3.10, 95%CI 1.04, 10.62 P = 0.04; with pain OR 3.08, 95%CI 1.09, 8.14 P = 0.03). *Conclusion:* Variations in treatment decision-making with respect to retaining periodontally compromised teeth exist between dental practitioners with and those without postgraduate training in implant dentistry. Furthermore differences in management approaches in how they would retain the teeth or rehabilitate the dental arch were apparent.

Demineralization of the contacting surfaces in autologous onlay bone grafts improves bone formation and bone consolidation.

Rezende ML, Consolaro A, Sant'Ana AC, Damante CA, Greghi SL, Passanezi E. J Periodontol. 2013 Oct 30.

Background: Autologous bone grafts are usually well consolidated after 4 to 5 months, but can be incompletely interlocked with the native bone. This study investigated the effect of acid demineralization of the graft-bed interface on graft consolidation. *Methods:* Onlay bone grafts were performed on the calvaria of 36 guinea pigs. Half of the animals had the graft-bed contacting surfaces demineralized with 50% citric acid (pH 1.0) for 3 minutes (test group). The other half received no demineralization (control group). The bone grafts were immobilized by a resorbable membrane glued to the recipient bed with cyanoacrylate. After 7, 30, and 90 days, specimens (n = 6) were obtained for light microscopy. Data from qualitative analysis and computerized histomorphometry were statistically processed at a significance level of 5%. *Results:* Osteogenesis was not seen at the interface after 7 days. After 30 days, the test group showed 34.39% ± 13.4% of the interface area filled with mineralized tissue, compared to 17.14% ± 8.6% in the control group (P = 0.026). After 90 days, the mean percentages of mineralized tissue at the interface in the test and control specimens were 54.00% ± 11.23% and 38.65% ± 7.76% (P = 0.041), respectively. Within groups, a higher percentage of the area filled with mineralized tissue was seen at 90 days compared to 30 days (P = 0.004 for control and 0.041 for test). *Conclusions:* Demineralization of the contacting surfaces between autologous bone graft and bone bed improved new bone formation and bone consolidation. These data need to be confirmed in humans.

Osteotome sinus floor elevation with and without grafting: an animal study in Labrador dogs.

Si MS, Mo JJ, Zhuang LF, Gu YX, Qiao SC, Lai HC. Clin Oral Implants Res. 2013 Dec 20.

Objective: To evaluate implant stability and histological outcomes after osteotome sinus floor elevation (OSFE) procedure, and to compare new bone formation and implant osseointegration with and without grafting. *Material and Methods:* OSFE with simultaneous implant placement was conducted bilaterally on six Labrador dogs. Twenty-four implants were placed. The right side sinus (Group 1) was grafted with biphasic calcium phosphate (BCP), whereas the left side (Group 2) was left without any grafting materials. The animals were euthanized 8 and 24 weeks after surgery for histological and histomorphometric assessment. Bone-to-implant contact (BIC%), alveolar bone height (ABH), bone density (BD) and grafting material density (GMD) were measured. The implant stability (ISQ) was assessed using resonance frequency analysis (RFA) at implant placement and 1, 2, 4, 8, 12, 24 weeks after surgery. *Results:* Endo-sinus new bone with direct contact to implant surface were observed in two groups at both time points. ABH showed no difference between groups at both time points. BIC% and BD in Group 2 (40.05%, 35.90%) was higher than those in Group 1 (23.30%,25.59%) at 24 weeks. Significant shrinkage of grafting material was seen in Group 1. The GMD in Group 1 at 8 weeks was 24.35%, while it dropped to 19.90% at 24 weeks. The changing pattern of ISQ for both groups were similar. *Conclusions:* Spontaneous new bone formation and better bone-to-implant contact were found for OSFE without grafting. The grafting material application during OSFE procedure showed no advantages in histological results.