

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

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Are marginal bone levels and implant stability/mobility affected by single-stage platform switched dental implants? A comparative clinical study

Dursun E, Tulunoglu I, Canpınar P, Uysal S, Akalın FA, Tözüm TF.

Clin Oral Implants Res. 2012 Oct;23(10):1161-7.

Objectives: The aim of this study was to evaluate short-term bone level and stability/mobility measurement alterations at platform switched (PS) and standard platform (SP) implants placed in mandibular premolar/molar regions using a single-stage protocol.

Material and methods: Sixteen PS and 16 SP implants restored with fixed prosthesis were included. Standard implant dimensions were used for both implant systems. After 3 months of osseointegration, implants were connected to abutments and final restorations were performed. Marginal bone loss was measured by standardized periapical radiographs. Implant stability/mobility was determined by resonance frequency

analysis (RFA) and mobility measuring (MM) device values. Peri-implant parameters were evaluated with clinical periodontal indices and all parameters were assessed at baseline, 1, 3, and 6 months after the surgery. **Results:** After 6 months, all implants showed uneventful healing. Radiographic evaluation showed a mean bone loss of 0.72 mm for PS and 0.56 mm for SP implants, and there were no significant differences between implant types. At 6 months, mean implant stability quotient (ISQ) values were 73.38 and 77 for PS and SP implants, respectively. Mean MM values were -4.75 for PS and -6.38 for SP implants. Mean MM values were lower for SP implants compared to PS implants at all time points. No significant differences were detected between implant types according to clinical peri-implant parameters. **Conclusions:** The micro-gap at crestal level which immediately exposed to the oral cavity in non-submerged two part implants seems to have adverse influence on the marginal bone level.

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Platform switching and marginal bone-level alterations: The results of a randomized-controlled trial

Canullo L, Fedele GR, Iannello G, Jepsen S.

Clin Oral Implants Res. 2010 Jan;21(1):115-21.

Objectives: This randomized-controlled trial aimed to evaluate marginal bone level alterations at implants restored according to the platform-switching concept, using different implant/abutment mismatching. **Material and methods:** Eighty implants were divided according to the platform diameter in four groups: 3.8 mm (control), 4.3 mm (test group(1)), 4.8 mm (test group(2)) and 5.5 mm (test group(3)), and randomly placed in the posterior maxilla of 31 patients. After 3 months, implants were connected to a 3.8-mm-diameter abutment and final restorations were performed. Radiographic bone height was measured by two independent examiners at the time of implant placement (baseline), and after 9, 15, 21 and 33 months. **Results:** After 21 months, all 80 implants were clinically osseointegrated in the 31 patients treated. A total of 69 implants were available for analysis, as 11 implants had to be excluded from the study due to early unintentional cover screw exposure. Radiographic evaluation showed a mean bone loss of 0.99 mm (SD = 0.42 mm) for test group(1), 0.82 mm (SD = 0.36 mm) for test group(2) and 0.56 mm (SD = 0.31 mm) for test group(3). These values were statistically significantly lower ($P < 0.005$) compared with control (1.49 mm, SD = 0.54 mm). After 33 months, five patients were lost to follow-up. Evaluation of the remaining 60 implants showed no difference compared with 21 months data except for test group(2) (0.87 mm) and test group(3) (0.64 mm). There was an inverse correlation between the extent of mismatching and the amount of bone loss. **Conclusions:** This study suggested that marginal bone level alterations could be related to the extent of

implant/abutment mismatching. Marginal bone levels were better maintained at implants restored according to the platform-switching concept.

Immediate rehabilitation of the edentulous mandible with screw type implants: Results after up to 10 years of clinical function

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Wegscheider W, Pertl C, Lorenzoni M.

Oral Implants Res. 2012 Oct;23(10):1217-23.

Objectives: The aim of this prospective case series was to evaluate the results of an immediate loading concept using four Xi VE S plus implants in the edentulous mandible, after a period of up to 10 years of clinical function. **Material and methods:** Thirty patients were treated with four implants each placed interforaminally and provisionally restored within 1 week. Radiographic bone levels, condition of the peri-implant mucosa, implant survival and success were recorded annually from implant insertion (baseline) up to 10 years after final restoration. **Results:** A total of 120 Xi VE S plus implants were placed in the interforaminal region. A significant coronal bone loss of 1.80 mm (SD 4 0.65) was recorded within the first 8 years of function ($P < 0.001$). Within the next years no further significant increase of bone resorption was observed. The mean values of the plaque, calculus, bleeding and mucosal indices and probing depth remained low throughout this period. All implants were inserted with an insertion torque of more than 32 N cm. Two losses (1.7%) occurred prior to permanent restoration (1 and 3 months post-insertion), resulting in a survival rate of 98.3% over the entire observation period. Four implants were recorded as failures due to excessive bone resorption, resulting in an overall success rate of 95%. **Conclusions:** The results

of this study indicate that in selected patients immediate restoration of dental implants in the edentulous mandible will achieve a clinically predictable outcome.

Biological complications and peri-implant clinical and radiographic changes at immediately placed dental implants. A prospective 5-year cohort study

Rodrigo D, Martin C, Sanz M.

Clin Oral Implants Res. 2012 Oct;23(10):1224-31.

Objectives: To evaluate clinically and radiographically immediate implants 5 years after insertion and to compare them with delayed-placed implants in the same subjects. **Material and methods:** Twenty-two consecutive patients that needed at least two implants for replacing hopeless teeth, one immediately upon extraction and the other in a delayed fashion (at least 4 months post-extraction) were selected in this prospective cohort study. Post-extraction immediate implants (II) and delayed implants (DI) groups were defined. One and 5 years after implant loading, clinical and radiographical outcome variables were recorded and analyzed both at site and at implant level. Intragroup and inter-group comparisons were performed. **Results:** The intergroup comparison did not show significant differences for plaque index, bleeding on probing and suppuration. These parameters worsen in both groups along the study. This trend was stronger for the plaque index in the group II, which increased from 15.6% at 1 year to 25.9% at 5 years ($P < 0.04$). One year after loading, the sites with probing depth ≥ 5 mm were higher for the group II compared to DI (2.5% vs. 0%; $P = 0.049$). At the end of the study, no significant statistical differences were found. Radiographically, bone crestal changes did not yield significant differences. During the follow-up period,

25% of the implants (26.4% in group II and 23.5% in DI) showed biological complications: Mucositis (20%) and/or peri-implantitis (5.8%). No differences between groups were found. **Conclusions:** Within the same patients, the implants placed with the immediate protocol demonstrated a higher tendency to crestal bone loss and to peri-implantitis, although these differences were not statistically significant.

Influence of bone augmentation procedures on the short-term prognosis of simultaneously placed implants

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Lorenzo Bermejo J, Eiffler C, Schwarz S.

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Objectives: The purpose of this study was to investigate the effect of simultaneous bone-augmentation procedures, and their combination, on the survival of dental implants and on the incidence of complications. **Material and methods:** Within a retrospective analysis, 958 implants placed in 404 patients (mean age 58.18) were selected from a prospective clinical study. In 304 cases of reduced bone width, bone spreading ($n = 217$) with hand osteotome, or bone splitting ($n = 15$), or guided bone regeneration ($n = 72$) combined with autogenous bone grafts were also performed. Eighty-eight implants were placed in combination with simultaneous internal sinus floor elevation without using graft material. For 194 additional implants, several augmentation procedures were combined because of extensive bone deficits. Three-hundred and seventy-two conventionally placed implants served as controls. Implant failures and complications were recorded after a mean observation period of 2.1 years (maximum 6.9 years). **Results:** Seventeen

failures and nine additional implant-related complications were observed. After 4 years, Kaplan-Meier curves revealed a probability of survival without complication of 97.5% for conventionally placed implants, and 95.8% for implants placed in combination with a single augmentation technique. If several augmentation techniques were combined, success decreased to 94.1%. Complication-free survival differences between combined augmentation techniques and conventionally placed implants were significant ($P = 0.004$). Age, gender, and location showed no effect on implant survival. **Conclusions:** It can be concluded that simultaneous bone-augmentation techniques slightly reduce short-term prognosis for dental implants. This effect was more pronounced when advanced defects required the combination of several augmentation procedures.

Quantitative biomechanical analysis of the influence of the cortical bone and implant length on primary stability

Hong J, Lim YJ, Park SO.

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Objectives: The aim of the study was to investigate the influence of cortical bone and increasing implant fixture length on primary stability. Further investigation

considered the correlation between the presence of cortical bone at the marginal bone and implant stability measured by insertion torque (IT) and resonance frequency analysis (RFA), as well as implant length, were determined. **Materials and methods:** Two different types of polyurethane bone models were compared. (Group 1: With cortical and cancellous bone; Group 2: With cancellous bone only). A total of 60 external type implants (\varnothing 4.1, OSSTEM[®], US II[®]) with different lengths (7, 10, and 13 mm) were used. IT was recorded automatically by a computer which was connected to the Implant fixture installation device during the placement. RFA was conducted to quantify the primary implant stability quotient (ISQ). All two measurements were repeated 10 times for each group. **Results:** All these differences were statistically significant between the two groups ($P < 0.001$) and intragroups ($P < 0.001$). Upon comparing the IT, cortical bone appears to have a greater influence on implant stability than implant lengths, whereas the RFA value strongly affects implant length rather than the presence of the crestal cortical bone. **Conclusions:** The quantitative biomechanical evaluations clearly demonstrated that primary implant stability seems to be influenced by the presence of a cortical plate and total surface area of the implant fixture appears to be the decisive determinant for ISQ value.