and width of keratinized mucosa. Bone loss (BL) was measured from digital panoramic radiographs. Linear Regression analysis was performed separately for both biomechanical conditions. Results: The correlation between BL and CIS was significant for the 152 sites around splinted implants ($p < 0.01$). On the contrary, this correlation was observed to be insignificant in the unsplinted situation ($p = > 0.215$). For CIS values of 2 and above, the regression line for splinted implants was significantly above that of single-standing implants ($p < > 0.01$).

Discussion: At a lower stress level, inflammation does not notably increase bone loss around dental implants. In case of higher stress, a proportional relationship between superimposed inflammation and bone loss seems to exist.

151 | Poster

Influence of fixation mode and superstructure span upon strain development of implant FPDs

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Introduction: Implant-borne FPDs should fit passively in order to avoid complications ranging from screw loosening to loss of osseointegration. The goal of the study presented was to measure the strain development of 3-unit and 5-unit screw- and cement-retained implant supported FPDs. The influence of the parameters retention mechanism and bridge span was to be evaluated.

Methods: Three ITI implants were anchored in a measurement model based on a real life patient situation and strain gauges were fixed mesially and distally adjacent to the implants and on the bridge pontics. During cement setting and screw fixation of 40 implant FPDs (ten samples from each group: 3-unit cementable; 5-unit cementable; 3-unit screw-retained; 5-unit screw-retained), the strain development was recorded. For statistical analysis, multivariate two-sample tests were performed with the level of significance set at $p = 0.1$.

Results: The comparisons of the four groups did not show significant differences in strain magnitude, neither did the two bridge spans reveal significant differences ($p = 0.18$ for cementable FPDs; $p = 0.22$ for screw-retained FPDs). Similarly, the two fixation modes had no significant influence on strain development ($p = 0.67$ for 3-unit FPDs; $p = 0.25$ for 5-unit FPDs).

Discussion: Within the limits of this study, bridge span and retention mechanism appear to have only a minor influence upon strain development in implant FPDs. As implant-supported bridges have served successfully over time, the question arises as to whether an ''absolute'' passive fit is a prerequisite for successful implant restorations.

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152 | Poster

Alkali treatment – new concept of titanium implant surface modification

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Objectives: This study presents properties of recently developed alkali-treated titanium implant surface and evaluates the effect of early-loading protocol on the success rate of the alkali-treated implants.

Methods: Four surfaces - alkali-treated, machined, sandblasted, and acid-etched - were tested. They were analyzed using electron microscopy and x-ray photoelectron spectroscopy. The wettability was determined using dynamic contact angle measurement and the real surface area was measured using krypton adsorption isotherm. The level of surface hydration was evaluated by infrared spectroscopy. In the 34-month clinical study the success rate of 1013 alkali-treated implants (Impladent STI-Bio, Lasak Ltd. Prague, Czech Republic) was evaluated. The healing period of these implants was 50% shorter than the conventional time.

Results: The alkali treatment of the titanium created a porous, hydrated, and reactive titanium oxide surface. The contact angle of the alkali-etched surface significantly decreased ($\Theta = 29.9^\circ$) compared to that of the acid-etched ($\Theta = 119.7^\circ$) and sandblasted ($\Theta = 79.9^\circ$) surfaces. The level of surface hydration was increased 14 times compared to the acid-etched surface. The relative surface area of the machined, acid-etched, and alkali-etched titanium was 1.4, 7.2, and 137.9 respectively. In the clinical study no difference in the success rate of early loading and delayed loading protocol was found.

Conclusions: The alkali-treated surface proved to possess more favorable properties compared with other tested surfaces. The 50% shortening of standard healing period had no significant effect on the implant success rate.

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153 | Poster

Loading of ITI implants after sinus floor elevation without grafting material

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Introduction: In the posterior maxilla when the available bone height is < 6 mm, sinus lift with grafting material is advocated. This study assesses the viability of a procedure where ITI-SLA implants have been placed in reduced bone height sites, with localized membrane elevation through alveolar bone crest but without grafting material. After healing of 2–4 months, abutments were tightened at 35 Ncm and loaded.

Material and methods: 16 patients received 27 SLA-ITI implants at sites (15 molar, 12 premolar) with 2–5 mm bone height on at least one proximal implant side. Bone was drilled until 1 mm of the sinus floor, the Schneiderian membrane was then carefully elevated with osteotomes. Bone quality was 9 × TypeII, 11 × TypeIII, 7 × TypeIV. Implant length was 1 × 6 mm, 2 × 8 mm, 24 × 10 mm, ∅4.1 mm implants were 23; 4 were ∅4.8 mm. After healing of 61–127 days (mean 95.1days) abutments were tightened at 35 Ncm. If resisting abutment tightening, implants were loaded and radiographically followed for crestal bone loss (CBL).

Results: During implant placement, membrane perforation occurred twice. All implants achieved primary stability and maintained it after 2–4months. All implants but one (typeIV after 104days) resisted abutment tightening, it was left to heal and osseointegrated. 15 implants have been loaded for 3 months, 7 for 6 months. 2 implants showed CBL on the mesial side down to the first thread.

Discussion and conclusion: Implant primary stability could be achieved through sinus elevation with osteotomes without grafting material. After 2-4months and despite reduced bone height, all implants but one resisted 35 Ncm. CBL following 3–6months of loading was minimal despite limited bone support.

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154 | Poster

Sinus lift procedures with a surgical microscope. A preliminary report

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Introduction: In the posterior maxilla, the presence of the sinus can limit the residual bone height for standard implant placement. Sinus floor elevation with grafting material is indicated to recover sufficient bone height. The main complication of this invasive and complex procedure is membrane perforation. Several techniques have been proposed to avoid membrane perforation like ultra-sonic debridement, piezo-bone surgery, the use of vaso-constrictive solutions and endoscopy. We report here on the use of a surgical operating microscope.

Material and methods: Eleven sinus lifts have been performed in 8 patients, 4 males and 4 females (mean age 57 y). A Leica M400 microscope was used during bone window preparation with rotating instruments, during membrane elevation and bone grafting with deproteinized bovine bone mineral. The common working magnifications were × 10 and × 16; × 25 and × 40 magnifications were used for access to details.

Results: Membrane perforation was avoided in all cases. Magnification, co-axial illumination, and colour filters to reduce glare were useful during all steps of the grafting procedure. Endosinusal vision, perception in details of the sinus anatomy and identification of septa eased access to the sinus, membrane elevation, bone grafting and documentation.

Discussion and conclusion: Ergonomical operating position was an additional advantage. Inconveniences of the method were the limited depth and field of vision. A learning curve was necessary to overcome these limitations. Membrane perforation rates up to 20–30% have been described; with the microscope, membrane perforation was avoided in all cases. The surgical microscope seems useful to avoid membrane perforation.

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155 | Poster

1-Year clinical results with three-dimensional surface on stepped-screw implants

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Introduction: Prerequisite for new bone synthesis at the implant interface is cell adhesion and proliferation. Recent studies revealed that grit-blasted and high temperature etched surfaces showed the best results regarding the influence of the micromorphology on the initial cell contact. Since July 2003, FRIALIT® CELLplus implants (DENTSPLY Friadent Mannheim, Germany) have been placed in 10 international centers to investigate the clinical performance of the new surface. The aim of this poster is to present the one year outcome of this clinical use.

Material and methods: The data of 150 implants and 77 patients were documented and evaluated. To enhance the clinical situation, 29% of the patients underwent an augmentation procedure prior to the implant placement and 47% were augmented simultaneously. After an average healing time of 7,8 weeks the implants were recovered, the prosthetic restoration was fabricated and inserted. The first recall has been carried out after approximately 4 month.

Results: All implants healed uneventful. In two patients three implants were not osseointegrated. Average crestal bone loss was less than 1,5 mm at the first recall. The evaluation of the peri-implant soft tissue was also uneventful with an appropriate esthetic result if desired. The diverse regions of the jaws did not influence the outcome.

Conclusion: The insertion and the management of the implant with the microstructure characteristics were not influenced by the new surface preparation. The initial results show a high confidence even in more critical indications such as immediate extractions sides, early loading or after implant loss.

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