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

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Effect of interimplant distance (2 and 3 mm) on the height of interimplant bone crest: a histomorphometric evaluation

Elian N, Bloom M, Dard M, Cho SC, Trushkowsky RD, Tarnow D. *Effect of interimplant distance (2 and 3 mm) on the height of interimplant bone crest: a histomorphometric evaluation.* J Periodontol. 2011 Dec;82(12):1749-56. Epub 2011 Mar 29.

Background

Implants restored according to a platform-switching concept (implant abutment interface with a reduced diameter relative to the implant platform diameter) present less crestal bone loss than implants restored with a standard protocol. When implants are placed adjacent to one another, this bone loss may combine through overlapping, thereby causing loss of the interproximal height of bone and papilla. The present study compares the effects of two interimplant distances (2 and 3 mm) on bone maintenance when bone-level implants with platform-switching are used.

Methods

This study evaluates marginal bone level preservation and soft tissue quality around a bone-level implant after 2 months of healing in minipig mandibles. The primary objective is to evaluate histologically and histomorphometrically the affect that an implant design with a horizontally displaced implant-abutment junction has on the height of the crest of bone, between adjacent implants separated by two different distances.

Results

Results show that the interproximal bone loss measured from the edge of the implant platform to the bone crest was not different for interimplant distances of 2 or 3 mm. The horizontal position of the bone relative to the microgap on platform level (horizontal component of crestal bone loss) was 0.31 ± 0.3 mm for the 2 mm interimplant distance and 0.57 ± 0.51 mm above the platform 8 weeks after implantation for the 3 mm interimplant distance.

Conclusions

This study shows that interimplant bone levels can be maintained at similar levels for 2 and 3 mm distances. The horizontally displaced implant-abutment junction provided for a more coronal position of the first point of bone-implant contact. The study reveals a smaller horizontal component at the crest of bone than has been reported for non-horizontally displaced implant-abutment junctions.

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A Retrospective Analysis of Implants Immediately Placed in Sites With and Without Periapical Pathology in Sixty-Four Patients

Fugazzotto PA. *A retrospective analysis of implants immediately placed in sites with and without periapical pathology in sixty-four patients.* J Periodontol. 2012;83(2):182-6. Epub 2011 May 31.

Many patients requiring implant therapy present with hopeless teeth exhibiting periapical pathology. The advisability of implant placement in such situations has not been conclusively determined. Methods: Sixty-four patients underwent therapy in their maxillary incisor region. Treatment consisted of immediate implant placement in a site demonstrating periapical pathology, and immediate implant placement in a ''pristine'' site, either during the same visit or during separate visits. The implants placed in the sites demonstrating periapical pathology were followed in function for 117 months, with a mean time in function of 64 months. The implants placed in pristine sites were followed in function for 120 months, with a mean time in function of 62 months. Results: Two implants in the central incisor positions of one patient demonstrated 2 mm of buccal recession after 46 months in function. These implants were deemed esthetic failures, despite the absence of inflammation and continued clinical implant immobility, yielding cumulative survival rates of 98.1 and 98.2 for implants placed in sites with periapical pathology and implants placed in sites without periapical pathology, respectively, according to published criteria. Conclusions: Implants immediately placed in sites demonstrating periapical pathology yielded results comparable to those immediately placed in pristine sites. The difference in survival rates was not statistically significant. J Periodontol 2012;83:182-186.

Variability observed in mechano-regulated in vivo tissue differentiation can be explained by variation in cell mechano-sensitivity

Khayyeri H, Checa S, Tägil M, Aspenberg P, Prendergast PJ. *Variability observed in mechano-regulated in vivo tissue differentiation can be explained by variation in cell mechano-sensitivity.* J Biomech. 2011 Apr 7;44(6):1051-8. Epub 2011 Mar 5.

Computational simulations of tissue differentiation have been able to capture the main aspects of tissue formation/regeneration observed in animal experiments—except for the considerable degree of variability reported. Understanding and modelling the source of this variability is crucial if computational tools are to be developed for clinical applications. The objective of this study was to test the hypothesis that differences in cell mechanosensitivity between individuals can explain the variability of tissue differentiation patterns observed experimentally. Simulations of an experiment of tissue differentiation in a mechanically loaded bone chamber were performed. Finite element analysis was used to determine the biophysical environment, and a lattice-modelling approach was used to simulate cell activity. Differences in cell mechanosensitivity among individuals were modelled as differences in cell activity rates, with the activation of cell activities regulated by the mechanical environment. Predictions of the tissue distribution in the chambers produced the two different classes of results found experimentally: (i) chambers with a layer of bone across the chamber covered by a layer of cartilage on top and (ii) chambers with almost no bone, mainly fibrous tissue and small islands of cartilage. This indicates that the differing cellular response to the mechanical environment (i.e., subject-specific mechanosensitivity) could be a reason for the different outcomes found when implants (or tissue engineered constructs) are used in a population.

Predatory bacteria: A future biological antimicrobial agent?

Van Essche M, Quirynen M, Sliepen I, Loozen G, Boon N, Van Eldere J, Teughels W. *Killing of anaerobic pathogens by predatory bacteria*. Mol Oral Microbiol. 2011 Feb;26(1):52-61. Epub 2010 Nov 18.

Bdellovibrio and like organisms (Balos) can attack and kill gram-negative bacteria. The present study suggests that Balos could be potential living biological antibiotics for the prevention and treatment of periodontitis. Since almost all periodontal pathogens are gram-negative, ideally they should all be susceptible to predation of Balos. On the other hand, commensal and / or gram-positive beneficial microbiota must be resistant to predation of Balos. The potential antimicrobial activity of various Balos — also known as predatory bacteria — was studied against: 1) several major periodontal pathogens and 2) Agregatibacter actinomycetemcomitans (Aa) in combination with the non-target microorganism Actinomyces naeslundii (An) (decoy). Thus, six strains were tested in BALO Aa [Porphyromonas gingivalis (Pg), Prevotella intermedia (Pi), Fusobacterium nucleatum (Fn), Sputigena Capnocytophaga (Cs), Eikenella corrodens (Ec)], An-Aa [Porphyromonas gingivalis (Pg) , Prevotella intermedia (Pi), Fusobacterium nucleatum (Fn), Capnocytophaga sputigena (Cs), Eikenella corrodens (Ec)] and An. Bdellovibrio bacteriovorus HD100 proved to be the most versatile predator, reducing the viability of four of the six pathogens tested. Significant reductions in the viability of the pathogen reached by Balos reached 3.04 log10 Aa, 2.99 log10 for Ec, 2.70 log10 Fn, and 1.03 log10 Pi. The second part of the study revealed no differences in Bdellovibrio bacteriovorus HD100 predatory efficacy in a mixture of biofilm when different ratios of extract (Aa) against decoy (An) were tested. The overall results suggest that oral administration of BALO strains in high concentrations of inoculum has the potential to quickly decrease the numbers of a wide range of periodontal pathogens from the mixed oral microbiota. Thus, the results of this research support the ongoing research on predatory therapy for the development of an adjunct to standard periodontal therapy.

Minimally rough implant surfaces favor the repair in experimental defects of peri-implantitis

Albouy JP, Abrahamsson I, Persson LG, Berglundh T. *Implant surface characteristics influence the outcome of treatment of peri-implantitis: an experimental study in dogs.* J Clin Periodontol. 2011 Jan;38(1):58-64. Epub 2010 Nov 24.

Implant surfaces favor the repair of peri-implant experimental defects. In this article, the third of a series of this research group, it was investigated the characteristics of different oral implant surfaces and their effects on surgical treatment of peri-implantitis without antibiotics. In an in vivo study in dogs, four types of implants were used representing four different surface characteristics: type A = smooth (Biomet 3i), type B = TiOblast (Astra Tech AB), type C = SLA (Straumann AG), and type = D TiUnite (Nobel Biocare AB). Each one was placed on the left side of the mandible in six Labrador dogs. Three months after implant healing, experimental peri-implantitis was started by placing bands over a period of 12 weeks until 40 to 50% of bone loss had occurred. Four weeks later, the surgical treatment included full thickness flaps, removal of granulation tissue and mechanical cleaning of the surfaces of the implant using curettes and sterile saline solution in a gauze. No antibiotic regimen was instituted. After 12 to 18 weeks of surgery, the dogs were sacrificed and tissue blocks collected. Radiographs from

the beginning, 12 weeks and 36 weeks (18 weeks after surgery) were analyzed; clinical measures were not included. The results showed that the plate control exerted during post-surgical treatment improved the clinical symptoms of inflammation in the implant types A, B and C, while in the type D, the swelling and redness in the peri-implant mucosa persisted. In addition, three D-type implants were lost during follow-up. Radiographic bone gain was observed between weeks 12 and 36 of implant type A (2.22 ± 1.49 mm), Type B (1.59 ± 1.51 mm) and type C (0.89 ± 1.50 mm). In type D, however, additional bone loss 1.83 ± 2.37 mm did not occur. The difference between implant types A and D were statistically significant. The findings of this research were: 1) the resolution of peri-implantitis without systemic or local antimicrobial therapy is possible, and 2) the outcome of the therapy is influenced by characteristics of the implant surface in favor of minimally rough surfaces. Although bone mass gain observed following surgery for treatment of peri-implantitis with implant types A, B and C appear promising, the results should be interpreted cautiously because the process of healing in dogs can be different from humans beings.