
# ABSTRACT BOOK

## 0001

**Regression and Stabilization of Proximal Caries Using Separation and Sealing.**

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**Objectives** The aim of this split-mouth, randomized controlled clinical trial was to evaluate the efficacy of proximal sealing for arresting incipient caries lesions in adults in a one-visit session.

**Methods** A total number of 48 patients were selected, who had at least one pair of proximal initial carious lesions. At baseline the patient caries risk was analysed using the Cariogram analysis and both test and control surfaces were examined for *mutans streptococci* (ms) counts. A metal separator was inserted into the approximal space, which was slowly and gently screwed in intervals until the space between the proximal surfaces was at least 1 mm. This made it possible to diagnose the test surfaces, if a micro-cavity was present or not, before the sealing procedure. After the treatment the participants were asked to describe their pain perception during the separation procedure.

**Results** After 2 years, 212 surfaces in 45 subjects were examined by two external clinical observers independently, using standardized digital follow-up radiographs. The sealed test surfaces had regressed or were unchanged in 88% compared to baseline, while for the unsealed control surfaces the corresponding value was 60% ($p<0.0001$). Of these, regression was found in 67% in the test surfaces and 13% in the untreated surfaces ($p<0.0001$). There was a 5.6 higher chance for the sealed surfaces to show regression compared to the control surfaces. Neither the caries risk, the surface diagnoses, the ms counts nor the occurrence of a cavitated lesion seemed to influence the caries development. The separation treatment was well accepted by the patients.

**Conclusions** The method of separation for diagnose and sealing treatment in a single session seems to be a clinically applicable preventive method for proximal caries lesions.

## 0002

**Predicting Caries Using Social and Familial Factors: A Nationwide Classification-and-Regression-Tree Analysis**

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**Objectives** The family and social environment are likely of great importance to children's dental health. However, social and familial factors have never been evaluated as isolated caries predictors at the individual level. This nationwide study examined the discriminant ability of sibling caries and various other social and family-level factors in predicting caries risk.

**Methods** This study included all 15-year-olds in 2003 (index-siblings) and their biological siblings (co-siblings) born within ±3 years. For each individual, data on the outcome and risk predictors were compiled after linking the national dental, social, and population registers. The outcome was caries experience in co-siblings, measured by the DMFS index. The predictors included index-sibling caries, socioeconomic position (parental education, occupation, and income), gender, co-sibling birth order, ethnicity, and household type. The discriminant ability of the predictors was assessed using classification and regression tree (CART) analyses. Using CART, both fully-saturated and the simplest clinically-relevant decision trees that retained useful predictive power were generated. The predictive power of the models was evaluated using the Area under the Receiver Operating Characteristic curve (AUROC) statistic (AUROC: ≥0.8, excellent; 0.7–0.79, useful).

**Results** There were 23,847 sibling pairs (n=47,694) in the study. The prevalence of caries experience (DMFS>0) in the study population was 73.6%. The overall predictive power of the CART models ranged from useful to excellent (AUROC: fully-saturated trees, 0.8–0.82; clinically-relevant trees, 0.7). Index-sibling caries yielded the greatest influence in predicting co-sibling caries (~67% higher than parental education, the next best surrogate predictor). The simplest clinically-relevant tree contained only index-sibling caries and a socioeconomic position indicator as predictors. This model demonstrated perfect sensitivity (but poor specificity). Per this model, caries could be expected in ≥84% of co-siblings of adolescents with ≥3 caries-affected tooth surfaces (DMFS ≥2.94).

**Conclusions** Caries in a sibling might suggest preventive family-based approaches targeting co-siblings.

## 0197

**Bonding Effectiveness of Luting Strategies of CAD/CAM Materials to Dentin**

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**Objectives** The aim of this study was to evaluate the effect of composite, hybrid ceramic and feldspathic CAD/CAM materials and flowable; micro-hybrid composite and dual-cure resin cement used as luting material on micro-tensile bond strength (μTBS;MPa) to dentin.
**Methods** Composite (Cerasmart, GC; CS), hybrid ceramic (Vita Enamic, Vita; VE) and feldspathic (Cerec,Sirona; CE) blocks were cut in slabs of 4-mm thickness. VE and CE slabs were etched with 5% HF acid whereas CS slabs were sandblasted. All the specimens were conditioned with ceramic primer (GC). Mid coronal dentin of 36 extracted non-carious human third molars were standardized and randomly divided into three groups according to the CAD/CAM material which were further divided into three subgroups (n=4) in which the slabs were bonded to dentin using; highly filled flowable composite (G-aenial Universal Flo; GC; F), micro-hybrid composite (G-aenial; GC; M) and dual-cure resin cement (Linkforce; GC; LF) after application of an universal adhesive in self-etch mode (G-Premio Bond, GC) on dentin. Following storage in distilled water at 37°C for 24 hours, μTBS was evaluated (Instron). Data were analyzed with two-way ANOVA and post hoc Tukey's tests ($p<0.05$).
**Results** μTBS was significantly influenced by the type of CAD/CAM ($p=0.0001$) and type of resin luting material ($p=0.0001$). No significant interaction was found between this two variables ($p<0.0001$). VE+M and CS+M resulted in significantly lower μTBS (27.09±2.89MPa, 26.53±4.16 MPa) than VE+F and CS+F (33.73±4.16 and 30.78±3.08 MPa) ($p<0.05$), while no significant differences were evaluated between VE+M, CS+M and CE+M (24.90±3.09 MPa) ($p>0.05$). With all the CAD/CAM materials, LF and F exhibited significantly similar bond strength to dentin ($p>0.05$).
**Conclusions** Type of luting material and type of CAD/CAM block affect the bond strength to dentin. Highly filled flowable composite exhibits similar bonding effectiveness as the dual-cure resin cement for bonding of composite, hybrid ceramic and feldspathic CAD/CAM blocks to dentin.

## 0199

**Treatment of Peri-implant Mucositis with Decontamination and Modification of the Implant Prosthesis to Facilitate Access to Oral Hygiene**

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**Objectives** The present investigation is a randomized controlled clinical trial with a follow-up of 6 months with the aim of evaluate the resolution of inflammation in the peri-implant tissues and the stability of results, by improving access to hygiene / control of bacterial plaque (with the modification of the prosthesis supported by implants) and by providing personalized / patient-specific oral hygiene instructions.
**Methods** A sample of 48 patients receive a professional prophylaxis session of the entire mouth and specifically, in implants with the presence of mucositis, the mechanical instrumentation supra and subgingival with the prosthesis. Then, the patients are divided randomly into the control group and into the test group, in the latter a modification of the implant-supported prosthesis will be carried out to facilitate access to hygiene. In addition, individualized oral hygiene instructions are given to all patients included in the study.
The baseline clinical variables of plaque index, bleeding on probing, probing depth, suppuration and recession are compared with those obtained at month, 3 months and 6 months. The unit of analysis is at the patient level and the level of significance is set at 0.05 and the power at 80%.
**Results** After analyzing the results, it was observed that the reduction of the bleeding index is similar for both groups per month. This variable continued to decrease at 3 months in both groups, being higher in the test statistically significant. In addition, in the comparative analysis at 6 months, in the test group a value close to zero was reached, while the control group increased the rate of bleeding.
**Conclusions** The periimplant mucositis resolution is stable over time when a debridement is performed, modification of the implant prosthesis supported over-contoured and oral hygiene instructions are given.

## 0200

**One-shot Nano-device for Treatment of Peri-implantitis: Biological Proof of Concept**

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**Objectives** To compare biological effects of experimental nano device composed of nano-hydroxyapatite loaded with clindamycin, embedded in PLGA for continual release of daily MIC against Porphiromonas gingivalis for 21 days bone healing period (CLHap) with effects of nano-hydroxyapatite (Hap) and commercial bone substituent (BioOssÒ).
**Methods** 6 female beagle dogs with similar characteristics underwent teeth extractions, implant placement and ligature induced PI, and were further surgically treated. Following open-flap debridement, the biomaterials were randomly allocated to ensure the serial distribution of antimicrobial material for pharmacokinetic testing of antibiotic systemic release. The biochemical and microbiological markers were compared before disease induction (baseline), before the treatment (pre-op) and 3 months (3m) following treatment. GM-CSF, TNFa, IL-6, IL-10 and OPG concentrations were estimated using Luminex method, while the RT-

PCR kit was developed for quantification of the Porphyromonas gulae. Finally, following animal sacrifice, specimens were retrieved for histological analyses. Following fracture technique, decalcified samples were sectioned and stained for histomorphometric assessment of: apical extension of barrier epithelium (aBE), infiltrated connective tissue (ICT) area and respective apical extension (aICT).
**Results** The pharmacokinetic test confirmed safety of the experimental material according to undetectable blood concentrations of the antibiotic. The concentrations of P. Gulae, GM-CSF, TNFa, OPG, IL-6 and IL-10 significantly decreased following treatment only in CLHap group while in other groups the changes remained insignificant. Both ICT and aICT were significantly lower CLHap when compared to both control groups.
**Conclusions** Results of the present study demonstrated safe and promising treatment capacity of the experimental CLHap for managment of peri-implantitis.

## 0201

**Comparison of Four Different Instruments for the Decontamination of Implant Surfaces: An In-vitro Study**
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**Objectives** The aim of this study is to compare four mechanical instruments to decontaminate implant surfaces during surgical treatment of periimplantitis.
**Methods** 96 implants were dyed with blue ink and left 24 hours to dry before placing the implants in the created defects. Defects were created using Autocad software. The types of defects included in this sample are type Ib, Ic, and Ie (Schwarz et al. 2010). Once models had been created with Autocad ® (Autodesk, USA), these were converted to an STL file and printed in resin with Formlabs 3 3D printer (Formlabs, Massachusetts, USA).4mm diameter implants (Neodent ®, Straumann Group, Basel, Switzerland) were inserted in the defects.Implants were divided into 4 groups regarding the cleaning device: EMS Airflow with erythritol powder (Electro Medical Systems, Nyon, Switzerland), Ti-Brush (Straumann Group, Basel, Switzerland), ultrasonic tip, Teflon ultrasonic tip. 8 implants in each type of defect were treated with each of the cleaning instruments.All implants were cleaned for 1 minute by 2 periodontists with experience in all the devices.Pictures of the implants were taken and processed with the software Image J. The software was calibrated for the color of the ink or the implant surface. After defining a region of interest, the percentage of uncleaned surfaces were calculated.
**Results** None of the methods showed complete cleaning of the implant surfaces.EMS Airflow showed a better cleaning potential than the other devices followed by Ti-brush, ultrasonic tip and teflon ultrasonic tip.All the devices performed better in the coronal face of the threads than the apical.
**Conclusions** EMS Airflow showed the best cleaning potential in terms of elimination of the ink from the implant surface as compared with other mechanical instruments. However, none of the tested devices achieved a complete removal of the ink stains in any of the defects.

## 0202

**Experimental Peri-implantitis around Titanium Implants with a Modified Titanium Surface with a Phosphonic Acid Monolayer. NanoCT Results of an Experimental In-vivo Investigation.**
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**Objectives** Implant surface modifications through biomimetic agent coatings may facilitate a stronger bond to bone. It is hypothesized that this stronger bond may be more resistant to pathological conditions such as periimplantitis. It was, therefore, the aim of the present experimental in-vivo investigation to evaluate the resistance to experimental periimplantitis of an implant with a surface modification yielding a multi-phosphonate monolayer (SurfLink®) that enhances bone to implant contact.
**Methods** This was a randomized, split-mouth, pre-clinical in vivo investigation in 8 beagle dogs, comparing two implants with different implant surfaces, the test with a multi-phosphonate monolayer and the control with a standard oxidized moderate rough surface. Each animal provided 8 implant sites. Once the three mandibular premolars and the first molar were extracted and the sites were allowed to heal for a period of three months, four implants were installed per hemimandible and healing abutments were secured. After a 12 weeks healing period to allow osseointegration, experimental ligature peri-implantitis was induced for another 12 weeks. Then the ligatures were removed and Peri-implantitis was allowed to become chronic for 16 weeks, when the animals were sacrificed. The obtained specimens were preserved and scanned with a Bruker Nano CT scan. Tridimensional bone loss as well as tridimensional Bone to implant (BIC) contact was assessed with Nano CT.
**Results** No adverse events were observed at any dog at any time point. At sacrifice, the periimplantitis lesions had a mean 360 bone loss in the test group of 44.04% ±6,11and 40,18% ±7,88 in the control. These differences were not statistically significant. Similarly, no statistically significant differences between the two groups were found in terms of 360 radiographic BIC.
**Conclusions** The multi-phosphonate monolayer implant surface did not demonstrate a higher resistance to periimplantitis than the standard control in terms of 360 radiographical bone loss, and 360 radiographical BIC.