The research aimed to carry out a prospective radiographic study of condylar position, in eleven randomly selected patients who were referred to the Division of Oral and Maxillofacial Surgery of Piracicaba Dental School – Unicamp, for surgical correction of dentofacial deformity. All patients had the same diagnoses of condylar hyperplasia, and were consented to undergo Le Fort I osteotomy to advance the maxilla. The radiographic images were taken at the immediate pre-operative, immediate post-operative (1-2 weeks) and late post-operative (minimum of 6 months) period. Tracings on acetate paper were done for the submento-vertex radiograph, and for the tomographic images, in maximal intercusption, rest position and maximal opening, for the three periods. Linear measurements were made in the tomographic images, over the posterior, superior and anterior articular spaces. Tomographic images with the xenogenic graft at the test side, whereas the opposite side was allowed to heal spontaneously. Three (Minipig BR-1) were used. The defect was created at the mesial aspect of the 1st molar and adjacent tissues were histologically examined 4 weeks after surgery. The specimens were processed for histological and statistical analysis. The frequency of root resorption was evaluated with the aid of the image analysis software KS300 (2.18 mm) compared to the control group (3.26 mm). Results were statistically analyzed using ANOVA, Duncan’s post-hoc and Spearman correlation. ML and AIR average score values were as follows: 2.26 (1.34 and 2.22); 1.84 (1.84 and 2.26); 2.56 (2.56 and 3.11). Statistical differences were found between Groups AP and C for AIR (p < 0.05).

Although RS showed the lower ML and AP the lower AIR average values after 90-day oral environment exposure, no statistical differences were found among the three sealers tested and no correlation was found between ML and AIR, rejecting the tested hypothesis.

It was concluded that the biomaterial allowed tooth movement, avoided bone loss in height, did not cause significant damage to the tooth roots and was almost entirely replaced by new bone tissue after tooth movement.

H001

Radiographic assessment of condylar position after Le Fort I osteotomy in asymptomatic temporomandibular joints

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H002

The influence of biphosphonates on induced tooth movement and root resorption

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Biphosphonates are a class of drugs acknowledged for their ability to prevent bone resorption. The present study tested the following hypothesis: Could biphosphonates prevent root resorption once incorporated into denum or cement? Eighty-six Wistar rats (Rattus norvegicus, albino) with and without biphosphonate medication – alendronate, 1 mg/Kg twice a week – were submitted to induced tooth movement for 0, 3, 5 and 7 days. The orthodontic appliance consisted of a coil spring moving the left molar forward for 7 mm. Once the teeth were divided into two groups: the rats were divided randomly into two groups: the control group received no medication, whereas the Experimental Group 1 was submitted to alendronate treatment during the entire experimental period of 7 days. Experimental Group 2 received alendronate during inactive antimicrobial period and during the 7 days of testing. The results were statistically significant for the linear measurements of the articular spaces in any of the three tomographic images, as an artifact of the radiographic images, with significant difference only for the maximal opening, in both sides.

In conclusion, Le Fort I osteotomy for maxillary advancement did not cause any significant changes in this specific group of patients evaluated.

H003

Periodontal effects of rapid maxillary expansion: a computed tomography evaluation

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This study aimed at evaluating rapid maxillary expansion (RME) periodontal effects by means of computed tomography (CT). The sample comprised 8 girls aged 11 to 14 years, presenting with posterior clefts. All maxillary expanders were activated up to the full 7-mm capacity of the expansion screw. The patients were submitted to spiral CT scan before expansion and after a 3-month retention period, when the expansion was removed. One-millimeter thick axial sections were performed parallel to the palatal plane, comprising the dentofacial and subperiosteal areas of the maxilla. Multilayer reconstruction was used to measure buccal and lingual bone plate thickness and buccal alveolar bone crest level by means of the computerized method. Paired t-test was used to compare the pre-expansion and post-expansion measurements (p < 0.05). Pearson’s index was calculated to show the relationship between initial buccal bone plate thickness and buccal alveolar crest level.

Results showed that RME significantly reduced the buccal bone plate thickness of supporting teeth and conversely increased the lingual bone plate thickness. RME induced significant bone dehiscences on the buccal bone plate of supporting teeth. Nonetheless, these changes were not statistically significant for the linear measurements of the articular spaces in any of the three tomographic images, as an artifact of the radiographic images, with significant difference only for the maximal opening, in both sides.

These results allow us to conclude that the use of biphosphonates, alendronate, to be more specific, may increase the resistance to root resorption during induced tooth movement or even due to traumatisms.

H004

Orthodontic movement in bone defects filled with xenogenic graft: an in vitro study in mice

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This study investigated if it was possible to orthodontically move teeth in a bone defect previously filled with xenogenic graft, with emphasis on the reactions occurring on the teeth and adjacent tissues. Six minipigs (Minipig BR-1) were used. The defect was created at the mesial aspect of the 1st permanent molar and was filled with the xenogenic graft at the test side, whereas the opposite side was allowed to heal spontaneously. Three months later, an orthodontic appliance was placed in each quadrant to allow mesial movement of the 1st molar. When the experimental teeth were moved into nearly half the defect site, the animals were killed and biopsies of the areas of interest were performed. The mesial roots of the 1st molar and adjacent tissues were histologically examined 4 weeks after surgery for the presence of root resorption, and the bone loss in height was evaluated with the aid of the image analysis software KS300 (Zeiss®). Data analysis revealed that:

1. The extent of tooth movement was similar for both groups; 2. Periapical bone cementum loss of the test group compared to the control group was not statistically significant; 3. The thickness of the bone matrix and presence of bone resorption, and the bone loss in height were evaluated with the aid of the image analysis software KS300 (Zeiss®).

It was concluded that the biomaterial allowed tooth movement, avoided bone loss in height, did not cause significant damage to the tooth roots and was almost entirely replaced by new bone tissue after tooth movement.
In situ evaluation of the effects of CO2, laser and fluoride dentifrice on caries development in human enamel

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Previous in vitro studies have shown that the irradiation of dental enamel by CO2 laser combined with fluoride reduces the acid reactivity of enamel. However, no in situ studies have been performed on this subject. Thus, this study aimed to evaluate the physical and chemical changes promoted by a TEA (transversely excited atmospheric pressure) CO2 laser on the enamel, and the combined use of CO2 laser and fluoride, and on in situ enamel demineralization. Enamel surface changes after irradiation were monitored using FT Raman Spectroscopy and Scanning Electron Microscopy (SEM). In this cross-over study, 17 volunteers were palate appliances during 2 phases of 14 days each, and were submitted to 4 treatment groups, as follows: (1) non-fluoride dentifrice; (2) fluoride dentifrice; (3) laser irradiation plus non-fluoride dentifrice; and (4) laser irradiation plus fluoride dentifrice. A 20% sucrose solution was dripped on the slabs 8 X/day and the dentinfluences were kept 5 X/day. After the experimental period, mineral loss was assessed by enamel cross-sectional microhardness. The Raman spectrum of the irradiated slabs showed a decrease in the organic matrix/phosphate ratio. SEM analyses evidenced that fusion and melting occurred in the enamel. The results analyzed by two-way ANOVA and Tukey’s test showed that the mean mineral loss for groups 1 to 4 were 15.23±5.9, 8.017±6.534, 9.827±4.455, and 25.56±1.643 respectively. Percentage of caries inhibition for groups 2 to 4 were 47, 35 and 84% respectively.

The CO2 laser treatment inhibits caries in the human enamel, being more effective when combined with fluoride dentifrice.

Plaque F and Ca concentrations are correlated in areas with different water F levels after placebo or F dentifrice use


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This double-blind, crossover study determined the relationships between plaque and saliva concentrations of fluoride (F) and calcium (Ca) in 3 communities with drinking water F of 0.035 (A), 0.8 (B) and 3.5 (C) ppm during a 12-month period. The subjects (aged 10-16 years) were instructed about 12-hour plaque removal. Then they brushed the oral surfaces for 1.0 min and plaque was collected from the opposite side 1 h later. F in plaque was quantified by ICP-OES after digestion, buffered with HCl and analyzed with the electrode. Saliva F was analyzed after hexametaphosphate dissolution. Ca was analyzed by atomic absorption spectrometry. The results were analyzed using repeated measures ANOVA and linear regression (p<0.05). The average F level in plaque (±mg/kg dry wt) for PD and 1 h after PD were 27.9±4.3, 144±27 and 75.9±15 for A, 41.4±6.2, 176±36 and 70.1±12.5 for B; and 107±15, 231±43 and 115±17 g for C, respectively. In saliva, a similar trend was observed, except that F(Ob) obtained 12 after the use of placebo was 231±43 for A, 176±36 B and 70.1±12.5 C. Positive correlations (r<0.01) were found between F(B) and Ca in all the situations.

The results confirm our previous conclusion that plaque F levels depend on plaque Ca.

H011 Biomineralization of polyanionic collagen-elastin matrices and bone remodeling during calvarial bone repair

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Polyanionic collagen-elastin matrices (PCEMs) are osteoconductive scaffolds that present high biomechanical durability and efficacy in the regeneration of bone defects. In this study, the objective was to determine if these matrices are directly mineralized during the osteogenesis process and their influence in the organization of the new bone extracellular matrix. Samples of three matrices, with different negative charge density, were implanted in bone defects, in nude mice (n=6) (half-maxillar defect, 8 weeks). For each technique, the minidried samples were analyzed using the Shannon’s entropy and the fractal dimension of digital images. This combination of methods revealed that PCEMs were directly mineralized by osteoblasts and incorporated into the new bone, and that the extracellular matrix of the new bone is maintained. The changes in entropy were different in the different periods of analysis were exponential, and the fractal dimension followed a power law. The evolution of these matrices revealed that PCEMs were quickly remodeled, showing values increasingly similar to those of the original bone structure. Evolution of these values revealed that PCEMs were directly biomineralized by osteoblasts and incorporated into the new bone.

These results show that PCEMs have improved biological properties, skipping the biomaterial resorption phase, allowing the faster formation of new bone.

Analysis of Hunter-Schreger Bands as a Biometric Method of Human Identification

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Dental enamel is characterized by layers of prisms of regularly alternating directions. These successive layers form Hunter-Schreger Bands (HSB), which appear as dark and light bands when viewed with a polarizing microscope. The decay in the pattern of HSB in teeth have never been studied. The sample was composed of 265 lower central incisors. The following procedures were performed: the teeth were extracted at low magnification. The contrast of the captured images was increased and then they were analyzed in an atomic force microscope (Shimadzu SPM9500) with Tapping mode (Veitinger Demon 1.4 SDK/Fingeres). The software generated a list of biometric data comparisons with a similarity measurement (similarity). The measure of the similarity of the biometric data comparisons could be represented with a similarity matrix. We also analyzed the thickness of the bands, since this parameter is very variable and could be used to confirm the identification. The results demonstrated that the pattern of HSB is highly variable, being unique for each tooth. HSB could be observed in 96.7% of the teeth examined. Teeth with 0 or 1 minutiae comprised 4.1% of the sample. In these cases, the distinction could be made by simple visual inspection.

Thus, the biometric measurements of HSB proved to be a valuable method for personal identification, since enamel can reveal a sufficient range of conditions and the images could be easily obtained. These characteristics make HSB a potentially useful model for personal physical or biological measurements to give a clear description of an individual.

S. mutans is associated to dental caries. Several genotypes in the same subject could increase the ability of the microorganisms to stand environmental stress. This study aimed to evaluate if the specificity of colonization by S. mutans genotypes, exists, and to evaluate biofilm formation and sensitivity to acids of different genotypes. Eleven caries-free (CF) and 10 caries-active (CA) children were evaluated considering SM levels and number of S. mutans genotypes. S. mutans isolates were obtained from 4 distinct sites. A total of 339 samples were geno
typed with RAPD-PCR. The results showed that patients was not reported by 40% of the professionals working in the public sector. There were more few policies in public offices as to the use of protective barriers, except for the use of gloves, gowns and masks. The use of protective barriers was more reported by all professionals surveyed; nevertheless, glove change between patients was not reported by 40% of the professionals working in the public sector.
H017  Osteoclastogenesis induction by a novel Porphyromonas gingivalis phospholipid
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**Porphyromonas gingivalis** (Pg) synthesizes several classes of complex phospholipids (PLs) in addition to LPS. However, little is known about the biological effects of these PLs on bone resorption. Mouse osteoclast precursors, including RAW264.7 and bone marrow cells, were stimulated with a novel PL isolated from Pg. P0, a 110-kDa protein as a ligand for PL. Confocal microscopy revealed the co-localization of PL and its ligand on osteoclast precursors than RANKL, along with dentine-pit formation, which was not inhibited by RANKL decoy receptor OPg. Pg LPS, but not PL, induced TNF-a and IL-1b by RAW264.7 cells. Proteomic analysis identified a 110 kDa protein as a ligand for PL. Confocal microscopy revealed the co-localization of PL and its ligand on the surface of RAW264.7 cells. PL induced stronger phosphorylation of p38 MAP kinase than RANKL, supported by the inhibition of PL-mediated osteoclastogenesis with p38 specific blocker SB202190.

A novel Pg. gingivalis phospholipid that is distinct from LPS represents a new class of RANKL-independent osteoclast differentiation factor.

H018  Expression of the CLA and alpha-beta1 integrins by T cell lymphocytes in gingival tissues
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This work tests the hypothesis that TCR (a+b) T cells that home to the oral cavity are closely aligned with TCR (γδ) T cells in the cutaneous immune compartment and become activated in response to oral pathogens such as Porphyromonas gingivalis (Pg). Using flow cytometry, Eilotop, lymphocyte stimulation with peptides of Pg, cultural data, clinical assessment and confocal microscopy of biopsy tissue, expression of antigens was assessed. Adherent mononuclear cells were isolated from chronic periodontal disease lesions from the most common genus of periodontal pathogens (30 mg/mL) was fabricated according to the manufacturers’ instructions. Microhardness was measured with a Vickers hardness tester through twelve indentations on three samples of each material (10, 25 and 50). The wear test of six samples of each material was performed using a three-body abrasion wear machine (cycles of 200, 200, 1,000, 1,500, 2,000, 3,000 g at 1.7 mm/s and 0.05 mm). The wear resistance of five of the examined materials was superior to control with no significant difference among them.

H019  Dental scientific research in Brazil: quantitative aspects of production
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Scientific research has experienced considerable growth in recent years, expressed by a larger dissemination of specialized journals. This paper aims at finding out the current stage of scientific production in Odontologia through the researches presented in the 20th and 22nd Annual Meetings of SBPO (Brazilian Society for Oral Research). The methodology was based on the mailing of 1,350 questionnaires via electronic mail to the periodontists of the last two editions of the SBPO Annual Meeting. According to the questionnaires, the researches in 2003 were mainly concentrated in the following areas: Periodontology (16.67%), Public Health (14.2%) and Pediatric Dentistry (13.5%). Of the papers presented, 65.1% were quantitative studies, 15.1% were qualitative studies, 14% were case reports, 2% were systematic reviews and 3% were clinical research (34.1%). According to the surveys, the studies of highest impact where 17% with 10 and 1.7% with 1.5 citations.

From these results, it can be said that a large number of the researches presented in the SBPO meetings have been predominantly quantitative, with a clear focus on clinical and laboratory studies, and that the areas of concentration most commonly found were Periodontology and Public Health.

H020  Analysis of Fluoride Concentration in Mother’s Milk Substitutes
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Mother’s milk is the ideal food for children’s first months of life. However, there are situations that make its consumption impossible and substitutes like cow’s milk, infant formula and soy milk are employed. This research aimed to determine the fluoride content of some powder brands of these products and evaluate their possibility of dental fluorosis development by its consumption. Three cans from different batches in the majority of the analyzed brands. The reconstitution of all products in water with optimal water diffusion coefficients. Among the commercial adhesives, the solvated systems, SB and EX, showed the highest water sorption, solubility and fusion kinetics over a 28-day period. Resin composition and hydrophilicity (ranked by their Hoy’s solubility coefficients) correlated with water diffusion coefficients. The new technique tested was effective in reducing the permeability of bonded dentin.

H021  In vitro wear of deciduous and permanent teeth - simultaneous abrasion and erosion
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The aim of this study was to evaluate the wear performance differences between deciduous and permanent teeth caused by the association of abrasion and erosion. Fragments of forty human teeth (20 deciduous and 20 permanent teeth) were cast in acrylic rings, polished to expose an flat enamel area, and profiled with MTS 3D Profilometer. Three groups of methacrylate-based adhesives, phospholipid, were used to anchor the specimens in the artificial saliva storage device. Eighteen samples of each material (dimensions 4 x 6 x 3 mm) were subjected to cyclic fluoride challenge with a 5% solution fluoride mask. Significant statistical difference (p < 0.05) was found among the tests performed. The three groups showed a different fluoride release behavior. The deciduous enamel was more resistant to the cyclic fluoride challenge than the permanent enamel.

H022  In vitro abrasive wear and microhardness analysis of two dental composites filled with nanoparticles
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One of the most important properties of dental composites is their wear resistance. The presence of nanometric particles improves composite properties. The data were analyzed by ANOVA and Student’s t-test (p ≤ 0.05). The results showed that the highest hardness values were obtained for the commercial composite tested.

H023  Effects of potassium oxalate gel/adhesive agent combined application on dentin permeability: an in vitro study
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The treatment of dentin hypersensitivity with precipitation of insoluble salts or application of adhesive agents is usually not successful because precipitates are removed by brushing and current silanized adhesives are permeable membranes. We tested a novel approach to reduce water permeation across dentin treated with combined application of potassium oxalate followed by adhesive resins. Full crown preparations were cut on extracted human maxillary first molars embedded in deep posterior molars. The crown segments were connected to an automatic flow-recording device. Minimum and maximum permeability were recorded after air-removal and phosphoric acid treatment, respectively. New smear layer was created and the permeability was measured. The crowns were divided into 6 groups, and the groups were placed in artificial saliva for 60 days at 37°C and the tests were performed again. The data were analyzed by ANOVA and Student’s t-test (p ≤ 0.05). EsthetX’s hardness, before and after storage in saliva, was 64.3 and 52.2 HV, respectively. Filtek Supreme’s hardness was 60.8 and 53.1 HV. EsthetX’s wear rate, before and after storage on the antagonists, was 3E±2 and 3E±1 mm/N, respectively. Filtek Supreme’s wear rate was 6E±2 and 5E±1 mm/N. For the two tests, EsthetX presented better results than Filtek Supreme. Saliva caused a fall in the superficial hardness of the two materials, although it increased their wear resistance, suggesting that post-care took place with both materials.

H024  Water sorption and solubility of dental adhesive resins
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It has been speculated that the incorporation of more hydrophilic and ionic functional groups into dental adhesives may lead to increased water sorption by such materials. This study evaluated the water sorption, solubility and microhardness of two dental composites filled with nanoparticles, formulated to be used as dentin and enamel bonding agents. Four commercial adhesives were selected along with their solvent-monomer combination: the bonding resins of Adper Scotchbond Multi-Purpose (MP) and Clearfil SE Bond (SE) systems, and the “one-bottle” systems Adper Single Bond (SB) and Excite (EX). Five experimental methacrylate-based resins of known hydrophobicity (RI-1-R5) were used as reference materials. Specimen disks were prepared by dispensing the uncured resin into a mould (5 mm x 3.8 mm x 0.8 mm). After desiccation, the specimens were weighed and then stored in distilled water for evaluation of the water diffusion kinetics over a 28-day period. Resin composition and hydrophobicity (ranked by their Hoy’s solubility parameters) influenced water sorption, solubility and water diffusion in both commercial and experimental dentin bonding systems. The hydrophilic resins RI-1, RI-2, RI-3, and RI-5 showed the greatest water sorption, solubility and water diffusion coefficients. Among the commercial adhesives, the solvated systems, SB and EX, showed water sorption, solubility and water diffusion coefficients that were significantly greater than those observed for the non-solvated systems, MP and SE (p < 0.05).

The kinetics of water diffusion in methacrylate-based resins was positively dependent on adhesives’ hydrophilicity.

Antibacterial activity of resin cements with antibacterial agents incorporated

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Nowadays, indirect aesthetic restorations for posterior teeth have been more used due to our patients’ requests. One way to decrease the leakage at the tooth/restoration interface could be to incorporate antibacterial agents to resin cements. The aim of this study was to evaluate the antibacterial activity of resin cements with antibacterial agents incorporated using microorganisms Trichomonas vaginalis, Staph. aureus and chlorhexidine diacetate were incorporated in different ratios (1 and 3% w/w) into C&B - Biscom® and FilIL Magic Dual Cement - Vigodent® resin cements. The incorporation was performed manually using metallic spatula and a glass slab. After incorporation, the samples were manipulated according to the manufacturers’ instructions and placed on the agar plates inoculated with the bacteria. After 48 hours, the growth inhibition zone was observed and measured. All assays were carried out in triplicate under aseptic technique. Control groups with the resin cements without incorporation and the groups with triclosan incorporation did not show antibacterial activity. The groups with chlorhexidine incorporation presented antimicrobial activity observed by the presence of an inhibition halo. Positive control plates showed inhibition growth in all agar plates. The antibacterial effectiveness was influenced by the chlorhexidine concentration (ANOVA - p < 0.05). The groups with 3% w/w were more effective than those with 1% w/w in both resin cements (p < 0.05, Student’s t-test).

C&B and Fill Magic cements showed better antibacterial activity with chlorhexidine incorporation at 3% w/w concentration.

In vitro study of pulp healing after pulpotomy using three pulp-capping agents and variable methodologies

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This in vitro study was carried out to evaluate the reparative potential of pulp mechanically exposed followed by pulp capping with three different capping agents: Calcium hydroxide, Mineral Trioxide Aggregate (MTA), and PROROOT® MTA were evaluated considering the morphology, location, and extension of the reparative hard-barrier formation. Three methods were used to evaluate the images from the reparative area: Microscopy - Light, confocal microscopy - L-M, and optical microscopy. Five 12-month-old Beagle dogs were used. The exposed pulps were capped with the selected experimental or control materials and the cavities were restored with amalgam. After 90 to 106 days, the animals were sacrificed and the teeth surgically removed (“dry block”); were processed for SEM assessment. An image analyzer was used to measure the total area of the exposition and compare it to the area occupied by the hard-barrier. Data from SEM were evaluated to use morphology and location of the hard-barrier formation as well as the percentage of pulp wall obliteration, which was also measured by stereomicroscopy and optical microscopy.

PROROOT® exhibited the highest number of samples with complete hard-barrier formation when compared to the tested materials. Calcium hydroxide samples presented the lowest number of total repairs and the hard-barrier formation observed in a few samples exhibited amorphous histological characteristics. SEM evaluation did not allow detailed assessment of the hard-barrier formation such as its extension and location, therefore additional methods are necessary to determine the capacity of pulp tissue to respond to pulp therapy by deposition of a hard-barrier.

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This study investigated the effect of relining, cyclic loading and water storage on the ultimate flexural strength (FS) and the flexural strength at the proportional limit (FSpl) of a denture base acrylic resin (La-citone 550-L). Rectangular bars of L acrylic resin were made (64 x 10 x 2 mm) and relined (1.3 mm) with four relining resins (Kodrel-K, UG Gel Hard, Tokosso Rebase Fast-T and New Troliner-N). In addition, intact, single impression specimens relined with L acrylic resin were made (6x4 x 3.3 mm). Forty specimens were made for each material, divided into four groups (n = 10) and tested after 1) polymerization; 2) water storage for 30 days; 3) cyclic loading (10,000 cycles at 5 Hz) and 4) water storage for 30 days followed by cyclic loading. Data (MPa) were analyzed with 3-way ANOVA and Tukey’s HSD tests (p = 0.05). Only after water storage, L-U and L-T demonstrated an increased FS (41.94 to 50.64 MPa and 49.95 to 57.36 MPa, respectively) (p < 0.05). Only L-T demonstrated an increased FSpl (20.38 to 24.21 MPa) after water storage (p < 0.05). After cyclic loading, L-U and L-T demonstrated an increased FSpl (20.38 to 24.21 MPa) after water storage (p < 0.05). After cyclic loading, L-T demonstrated an increased FSpl (20.38 to 24.21 MPa) after water storage (p < 0.05). After cyclic loading, L-U and L-T demonstrated an increased FSpl. Data from the specimens presented the highest FS (between 78.57 and 85.90 MPa) and FSpl (between 31.30 and 34.17 MPa) for L-U and L-T, respectively. The FS and FSpl of all materials were detrimentally influenced by cyclic loading.

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The aim of this study was: to evaluate the adhesive systems to prevent nanoleakage in resin-dentin interfaces; and to analyze dentin bond strength, water sorption and solubility, ultimate tensile strength, elastic modulus and ultrasonic characteristics of the bonding agents. Adhesive systems that use different etching and infiltration strategies were used: two etch-and-rinse systems (Single Bond SB and Prime&Bond NT/FP); two two-step self-etching primers (Clearfil SE Bond/CT and Clearfil Protect Bond/CT); and one self-etching adhesive (One-up Bond/FOB). Tests were performed after 6 or 12 months of storage in water or mineral oil. Ammonium AgNO₃ was used as a tracer for the nanoleakage test. Specimens were prepared for Transmission Electron Microscopy (TEM). The TEM images were used to evaluate the leakage. Leakage was observed for measurements of water sorption and solubility, the mass of specimens was measured before and immediately after water-immersion, and after desiccation. The volume of specimens was measured, and sorption and solubility values were calculated and expressed in µg/mm². The elastic modulus and shear bond strength were determined using an Instron universal testing machine. The thickness of the resin-dentin interfaces was measured with a Optical Microscope. The data were compared using a two-way ANOVA test, and Tukey’s HSD tests (p = 0.05). The size of the leakage was determined by the percentage of the area occupied by the hard-barrier. Data were analyzed using the Fisher’s exact test at 5% significance level. One can conclude that L-U was the best adhesive system, since no nanoleakage was observed under the MTA, and PROROOT® MTA was the most susceptible to leakage. In conclusion, our results strongly suggest L-U as an extra-hepatic manifestation of hepatitis C. Thus, we believe that HCV carriers should be periodically and systematically submitted to intra-oral examination for OLP investigation. Moreover, OLP patients in special should be submitted to hepatitis C tests, due to the high morbidity and chronic, asymptomatic character of this liver disease.

Is daily chewing gum really effective to increase stimulated whole saliva?

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Subj ects with low saliva output can suffer from dry mouth, present increased risk of oral infections, as well as disturbed sleep. The effect of daily chewing gum on the unstimulated whole saliva has been demonstrated. However, it remains incomplete with regards to stimulated saliva. The aim of this experiment was to study the effect of chewing gum on whole stimulated saliva. The saliva flow rate of a sample of 30 women, with mean age of 57.16 years, was measured. This was done before and immediately after the experiment with chewing gum and at the first day of this within-subject study. The chewing gum was used daily for 15 min after breakfast, lunch and dinner, during three weeks. The data were analysed by descriptive statistic and using paired Student’s t-test (p-value < 0.05 was considered significant). The dose-response curve showed that an increase in the saliva output was observed at the moment that the chewing gum was used as well as disturbed sleep. The effect of daily chewing gum on the unstimulated whole saliva has been demonstrated. However, only for 15 of the subjects with initial saliva flow rate up to 0.7 ml/h a statistically significant increase (p < 0.05) of 75% was observed immediately after three weeks of the experiment.

The authors suggest that there might be a persistent increase in the whole stimulated saliva only for subjects by hypoalbuminemia, and an increase can occur for all subjects at the moment of use of chewing gum.

Comparison of hard tissue density changes around implants by conventional radiographs and digital subtraction images

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The aim of this in vivo study was to compare peri-implant bone density assessed by the mean gray value of the histogram in digitized radiographs and two digital subtraction radiographic methods, linear and logarithmic. Forty-four patients were monitored by standardized periapical radiographs one week after surgery and four months later. The radiographs were digitized and manipulated by means of EMAG® software. Linear and logarithmic digital subtraction radiographs were obtained, and a filter was added to the logarithmic method. After that, the images were divided into two groups, with and without bone loss, and statistical analysis was carried out. The results indicate that differences between the two groups with and without bone loss reached significance, in all the images and in both jaws, which was expected. But no statistically significant difference was observed when assessing radiographic density between the digitized radiographs and the two methods of subtracted images. Monitoring of peri-implant bone density by the mean gray value of the histogram in a selected area can be assessed either by linear and logarithmic digital subtraction images or by conventional digitized radiographs.

Analysis of tooth/restoration interface in dental enamel by using optical coherence tomography

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The integrity of the tooth/restoration interface is very important for the success of dental treatment. The evaluation of this site can be done using visual and tactile inspection, which can be helped by the use of radiographic techniques. These diagnosis methods, however, may not show all the information needed for a final and correct diagnosis. For this reason, alternative techniques have been proposed as auxiliary diagnostic methods for in vivo situations. This presentation describes the use of Optical Coherence Tomography (OCT) as a method to evaluate the tooth/restoration interface in dental enamel. Five extracted human molars were used in the research. One tooth was restored by the standard method, while in the other samples a gap of ~ 50 µm was purposely left at the tooth/restoration interface. The OCT system built for this research was based on Michelson Interferometer and on a wideband light source. A Titanium-sapphire laser was the light source that was employed operating at 800 nm, allowing 10 µm axial resolution and 32 µm lateral resolution. The results are shown in the following.

By using the OCT technique in the mentioned dental evaluation, it was possible to identify the exact location of the restoration failure in the tooth, and also make a quantitative analysis. This was not possible using the conventional methods. The research showed that OCT is a high-resolution non-invasive optical imaging technique and can become an important diagnosis method for Odontology.

A protocol standardized to be used in photodynamic therapy in animals

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Photodynamic therapy (PDT) has been applied mainly in neoplasias treatments in mucosa and skin surface neoplasia. It is also indicated in cases where surgery and clinical procedures do not respond to conventional treatments. Thus, PDT limited itself to very specific indications and poor prognostic cases, due to a lack of clinical trial studies and its high costs. Nowadays, multidisciplinary studies are being conducted looking for new drugs and lights sources that should be able to decrease the side effects of PDT and improve its selectivity. For this aim, a PDT standardized protocol for animals, 25 golden Syrian hamsters, was used in association with a hematoporphyrin photosensitizer drug (HpD), together with a diode laser, for in vivo trials. After establishing an adequate drug dose and a correct pathway of administration, PDT was applied on the left side surface of hamsters’ tongues after 12 hours of intraperitoneal administration of 10 mg/kg of HpD in 50, 100, 150 and 200 J/cm² fluences. Histological analyses were performed 6 days after the PDT treatment. Positive correlations were also observed between tissue alterations and fluences related to necrosis deepness and vascular penetration at 100, 150 and 200 J/cm².

Therefore, with these results, we may give support to clinical trials in animal models of carcinogenesis, analyzing the behavior of new drugs and new sources of lights, which should be more effective and economically accessible.

Hoechst 33258 transcriptions in oral squamous cell carcinoma

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P (21 is a potential tumor suppressor and has been identified as a p53 mediator and an inhibitor for cyclin-dependent kinases (Cdk) and proliferating cell nuclear antigen (PCNA). Changes in p21 conformation could adversely affect regulation of cellular proliferation and increase the susceptibility to cancer. In this study was conducted to investigate p21-waf1/cip1 gene alterations and a possible association with immunohistochemical expression of p21 in human oral squamous cell carcinomas (OSCC). Besides, p21-waf1/cip1 gene alterations were associated with clinicopathological parameters of oral cancer patients. Matched normal and cancer tissues from 31 patients with oral carcinomas and 50 saliva of saliva from healthy individuals were screened for p21-waf1/cip1 alterations by PCR (polymerase chain reaction) and sequencing. This study was performed using a real-time PCR and ELISA assay. The results showed that p21 expression was compared with clinicopathological parameters of oral cancer patients. Matched normal and cancer tissues from 31 patients with oral carcinomas and 50 saliva of oral cancer patients were screened for p21-waf1/cip1 alterations by PCR (polymerase chain reaction) and sequencing. In 25% of the patients with larger lesion, abscess in the jaw was present. The increased bone loss in NOKSO mice was associated with augment of osteoclast differentiation factor expression.

E-cadherin is important for tumor invasion and metastasis in oral squamous cell carcinoma.

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Detection of PITX1, PMX1 and TGIF transcripts in oral squamous cell carcinoma by in situ hybridization

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Oral squamous cell carcinoma (OSCC) is the eighth most common cancer worldwide. Homeobox gene family encodes transcriptional factors during development; hence it could be involved in carcinogenesis. The purpose of this study was to verify the presence of 3 homeobox gene transcripts (PITX1, PMX1, TGIF) in OSCC and adjacent non-tumoral tissues (NT). Twelve OSCC samples and 8 NT were obtained at HC-FMUSP. For in situ hybridization (ISH), serial sections were stained with digoxigenin-labeled sense and anti-sense riboprobes.

Signal was always located at the cell cytoplasm. For NT samples, PITX1 signal was seen in all epithelium layers in 33% of the cases. PITX1 was stained at basal and suprabasal layers in 80% of the samples and at all epithelium layers in 20%. Transcripts of TGIF were stained in 50% of the samples at basal and suprabasal layers, while in 50% of the cases they were dispersed, being more intense in the spinous cell layer. In OSCC, all genes were expressed in 100% of the cases. PITX1 staining was weak, although well-differentiated areas expressed more transcripts than poorly differentiated ones. PMX1 showed a spread signal, though more intense in areas with isolated carcinoma cells. TGIF transcripts were visualized in all tumor cells, but in poorly differentiated areas the signal was less intense.

These data show that PITX1 and TGIF have lower expression in OSCC compared with NT, while PMX1 has a higher expression. PITX1 showed a spread signal, though more intense in areas with isolated carcinoma cells. TGIF transcripts were visualized in all tumor cells, but in poorly differentiated areas the signal was less intense.

These results strongly suggest that these genes might be involved in OSCC carcinogenesis.

Stress analysis around implants’ external hexagon, internal hexagon and internal conical connectors, and one piece implants using photoelasticity


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This work aims to analyze quantitatively stress distribution around implants. Implants were fabricated with the same external design, differing only at the connectors: external hexagon (EH), internal hexagon (IH), internal conical (IC) and no connection to the abutment (one piece, OP). The samples were embedded in photoelastic models and submitted to two compressive loads: (1) axial, load L; and (2) 6.5 mm away from the center, load II. Sixty-one points around the implants were analyzed. The maximum shear stress values were determined by fringe order, thickness of the models and optical constant of the photoelastic resin. Graphs were made using the analyzed points, and their areas (distributed stress) were calculated in the two load situations, for the implant body and at the platform. No statistical differences were found for load I (Keski-Kallio-Wallin, p < 0.05). For load II, when analyzing the body of the implant, IH presented significant difference (Mann-Whitney U, p < 0.05), with the lowest values. The analysis of the platform region under load II revealed that IH presented significant differences when compared with EH and OP, with the lowest values, but with IC did not present difference (Mann-Whitney U, p > 0.05). The EH group presented the best results, with the lowest values, and IC the worst, with 12.9% more stress than IH for the implant body and 17.4% more stress at the platform region.

It could be concluded that for axial load the connectors did not influence stress distribution. For the load away from the center, the IH implants presented the best stress distribution, whereas at the platform region the IC also presented favorable results.

Evaluation of hexagon integrity of internal torque implants after simulating surgical placement under different torque levels


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In the controversial discussion about external and internal hexagon implants, the prosthetic predictability of the first and the easiness of surgical placement of the latter have been shown. A product available in the market with both qualities can mean an important technique improvement. The aim of this study was to evaluate the integrity of the external hexagon of a conventional implant (EH) and of a new implant (Internal Torque – IT), Neodent, Curitiba, Brazil, which is inserted by internal torque, without the need of a mount. A device was made to measure the rotational freedom degrees between hexagon of implant and abutment. Measures were obtained for EH and IT with the intact implant and after simulating surgical placement under 45, 60 and 80 Ncm torque levels. Data were submitted to Student’s t-test, showing no significant difference (p > 0.05) for the degrees of the intact implant: EH (3.3 ± 1.04°) and IT (3.14 ± 0.17°), and after 45 Ncm torque: EH (3.37 ± 0.38°) and IT (3.30 ± 0.26°). However, after 60 Ncm torque there were significant differences (p < 0.05): IT (3.53 ± 0.30°) and EH (4.03 ± 0.54°). After 80 Ncm torque, IT showed values of 3.59 ± 0.38°, whereas EH did not support the highest torque.

It could be concluded that the IT implant reacted similarly to the EH implant when intact and after 45 Ncm torque, and better than the EH implant after 60 and 80 Ncm torque. Furthermore, the external hexagon of the EH implant became deformed after 80 Ncm torque, showing that the surgical placement of the IT implant does not influence the integrity of the junction implant/abutment.

Fe gamma receptors Ia and Iib polymorphism in Brazilians with generalized aggressive periodontitis

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This study aimed to determine the frequency of the FcgammaRIIa and FcgammaRIIib haplotypes in Brazilian patients with generalized aggressive periodontitis (GAP) and periodontal health (PH). Thirty-one GAP subjects and 49 individuals with PH were selected. Pocket depth, clinical attachment level, bleeding on probing (BOP) and supragingival biofilm (SB) were recorded at 6 sites/tooth for all subjects. Mouthwash samples were collected for human DNA isolation. The genetic polymorphism was detected by PCR and hybridization with oligonucleotide probes. Differences in clinical parameters and frequency of allotypes/haplotypes between the groups were analyzed by Mann-Whitney, Chi-squared, and Configural frequency analysis. GAP patients presented significantly more attachment loss as well as BOP and SB (p < 0.001) than healthy individuals. The alleles H/131 - FcgammaRIIa and NA1 - FcgammaRIIIb were the most prevalent ones in this population. There was an over-representation of NA2 in GAP patients, whereas NA1 was more detected in PH individuals (OR: 32.5; 95% CI: 10.6 – 99.8; p < 0.001). No significant differences in the distribution of the H/H-131, H/R-131 and R/R-131 over-representation of NA2 in GAP patients, whereas NA1 was more detected in PH individuals (OR: 32.5; 95% CI: 10.6 – 99.8; p < 0.001). H041

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