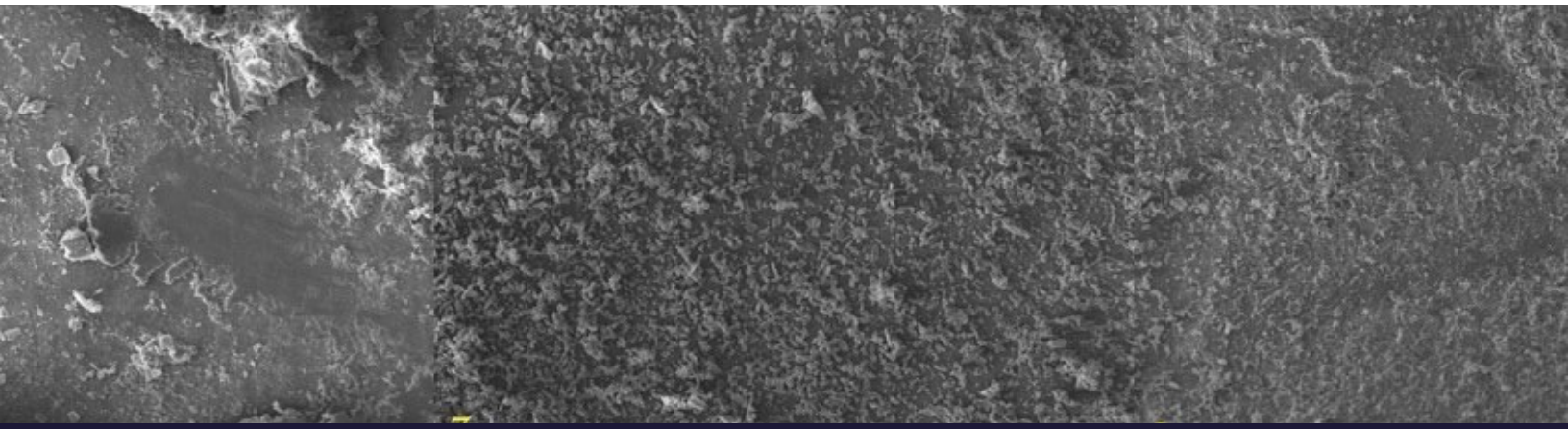
Abstract Book

IADR
International Association for Dental Research
Chilean Division



XXXI Reunion Anual IADR División Chilena

29 y 30 de agosto 2019

Universidad de los Andes

Oral Session

Phenotypic plasticity of regulatory T cells in experimental periodontitis

C. A. Alvarez Rivas[1,2], R. Huang[2], A. Rawan[2], M. Galindo[3], R. Vernal[4], A. Kantarci[5]
[1]Universidad de Chile, [2]The Forsyth Institute, [3]Universidad de Chile, [4]Universidad de Chile, [5]The Forsyth Institute

Objectives Objective: The immune homeostasis associated with periodontal health requires a regulated immuno-inflammatory response, during which the presence of regulatory T cells (Tregs) are essential to ensure minimal collateral tissue damage. Tregs may retain their lineage plasticity, the ability to switch their cell fate to other effector T cell subsets under sustained inflammation. The aim of this study was to determine the impact of periodontal inflammation in the phenotypic plasticity of Tregs *in vivo*.
Methods Methods: Ligature-induced experimental periodontitis was developed in C57BL/6. Animals without ligatures were used as controls. Alveolar bone loss was analyzed by micro-CT and morphometric analysis. The gingival mucosa was processed to analyze mRNA levels of Treg/Th17-associated cytokines, transcription factors, and receptors by q-PCR. The frequency and number of IL-17-producing Tregs and Th17 cells in cervical lymph nodes were analyzed by flow cytometry. Tregs from cervical lymph nodes were purified by cell-sorting to perform transcriptomic and epigenetic analyses *ex vivo*.
Results Results: The alveolar bone loss was associated with increased expression of Th17-related pro-inflammatory mediators in the gingiva (IL-17A, IL-17F, IL-6, and RANKL, >15 fold-change) and the infiltration of Treg and Th17 cells in cervical lymph nodes (>2 and >5 fold-change respectively). Tregs from cervical lymph nodes expressed IL-17 (>10%) and had reduced Foxp3 MFI (30% less) compared to Tregs from healthy controls. Tregs purified from animals with periodontitis showed a differential transcriptomic landscape were the expression of Th17-related genes was increased compared to controls.
Conclusions Conclusion: Tregs are phenotypically unstable and acquire Th17-associated functions during periodontitis, which is associated with increased bone loss and gingival inflammation.

Photodynamic Therapy: Bond Strength of Glass-Fiber Posts to Intraradicular Dentin

H. A. Banci, P. Pereira da Silva, H. Badaoui Strazzi Sahyon, J. Midori Nakao, P. Z. da Silva, P. H. Chaves de Oliveira, D. M. Tavares, L. T. Cintra, E. Dezan-Junior, R. Castilho Jacinto, J. E. Gomes-Filho, P. H. dos Santos, G. Sivieri-Araujo
São Paulo State University (Unesp), School of Dentistry, Araçatuba

Objectives The photodynamic therapy associated with photosensitizers is able to promote microbial reduction. However, studies evaluating the consequences of two sessions of photodynamic therapy with different photosentizers on the bonding strength of glass-fiber posts to endodontically treated intraradicular dentin are lacking. This study aimed to investigate the influence of two photodynamic therapy sessions using methylene blue and curcumin as photosensitizers on the bonding strength of glass-fiber posts to endodontically treated intraradicular dentin in different root thirds.
Methods Seventy-two bovine teeth were used and divided into 9 experimental groups according to the type and concentration of the photosensitizers, with or without light activation: Control - deionized water; Methylene blue 50 mg/L; Methylene blue 50 mg/L + laser; Methylene blue 100 mg/L; Methylene blue 100 mg/L + laser; Curcumin 500 mg/L; Curcumin 500 mg/L + LED; Curcumin 1000 mg/L; and Curcumin 1000 mg/L + LED. Push-out bonding strength of the fiber posts to endodontically treated dentin was evaluated using a universal test machine (n=8). Bond strength data were subjected to the Kruskal–Wallis test, followed by the Dunn test for comparing groups, and the Friedman test for comparing thirds (α=.05). Representative scanning electron microscopy images were obtained to qualify the failure mode of the specimens.
Results The use of curcumin at higher concentration, with or without blue LED activation, decreased the bond strength values compared to those of the control group in the apical region (P<.05). The intraradicular thirds promoted no difference for push-out bond strength values (P>.05).
Conclusions Curcumin photosensitizer influenced the bond strength of glass-fiber posts to intraradicular dentin, and methylene blue, at both concentrations, had no marked effect on the bond strength values at different depths of the root.

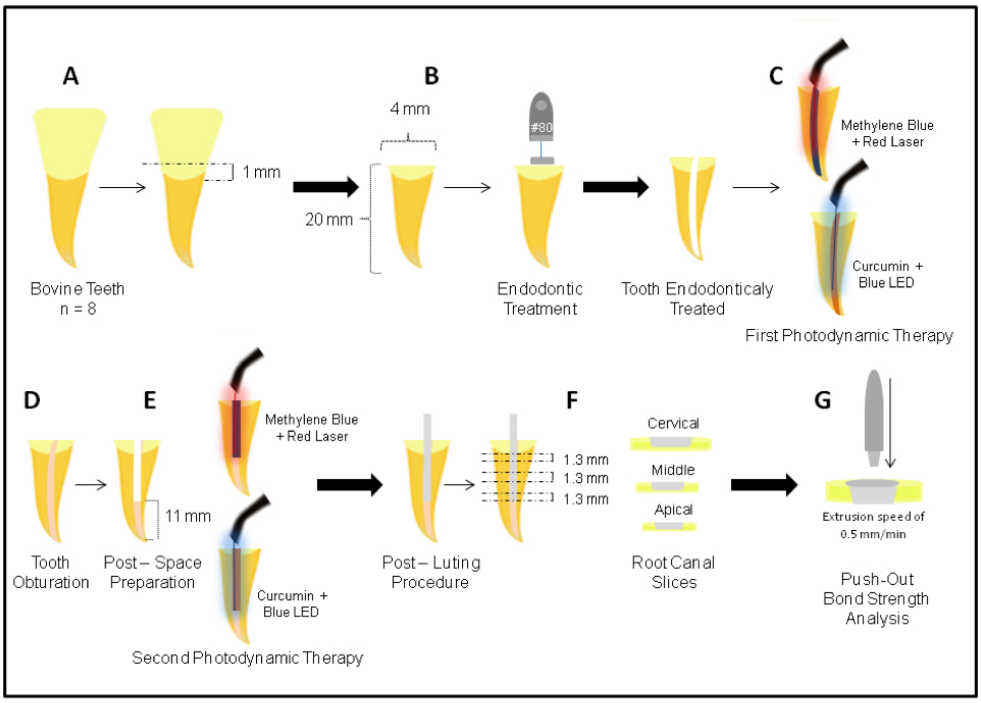


Figure 1. Specimen preparation. A, Removal of anatomic crown 1.0 mm above the cementum-enamel junction. B, Standardization of root canal length and diameter, and endodontic treatment with K-files #80. C, First photodynamic therapy session with methylene blue and curcumin photosensitizers associated or not with light action. D, Tooth obturation with gutta percha cones and calcium hydroxide cement. E, Intraradicular post-space preparation and subsequently second photodynamic therapy session. F, Cervical, middle and apical slices with approximately 1.3 mm in thickness. G, Push-out bond strength measurements with vertical compressive loading.

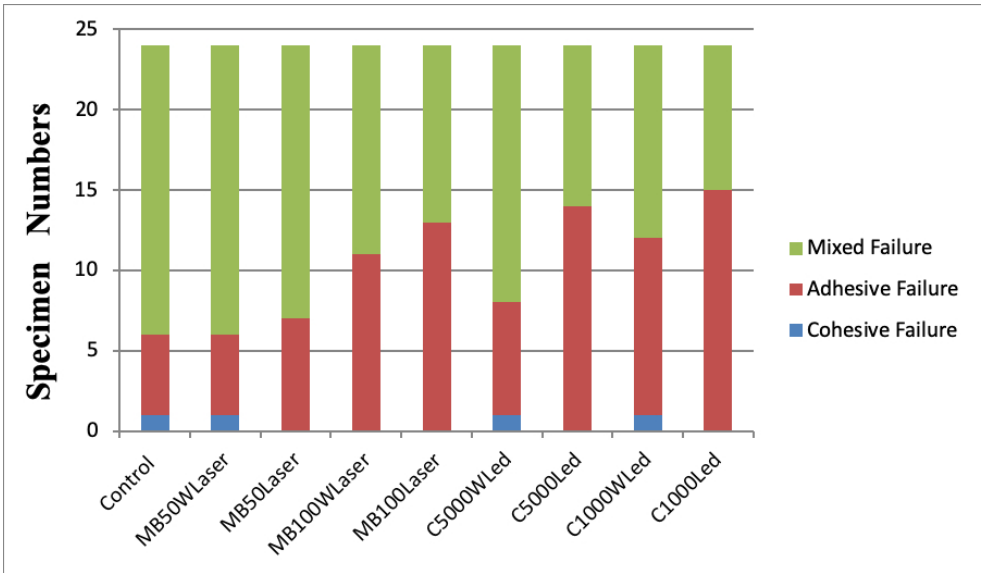
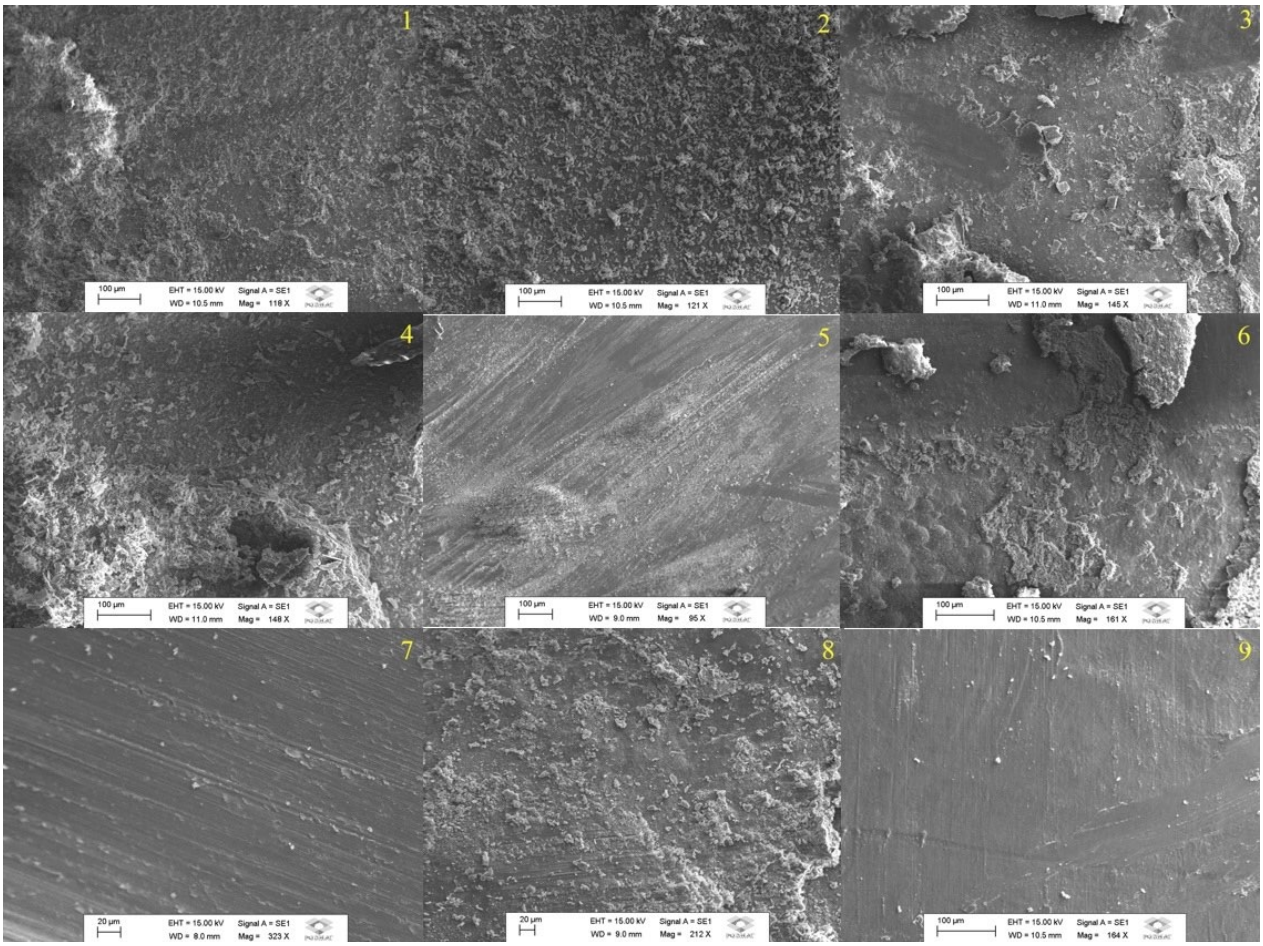


Figure 2. Incidence of fracture patterns (thirds specimen numbers) according to type of failure. $MB_{50WLaser}$, methylene blue 50 mg/L without red laser; $MB_{50Laser}$, methylene blue 50 mg/L activated with red laser; $MB_{100WLaser}$, methylene blue 100 mg/ L without red laser; $MB_{100Laser}$, methylene blue 100 mg/L activated with red laser; $C_{500WLed}$, curcumin 500 mg/L without blue LED; C_{500Led}, curcumin 500 mg/L activated with blue LED; $C_{1000WLed}$, curcumin 1000 mg/ L without blue LED; $C_{1000Led}$, curcumin 1000 mg/L activated with blue LED.



1)Scanning electron image (SEI) of mixed failure of dentin irrigated with deionized water (control); 2)SEI of mixed failure of dentin after treatment with methylene blue 50mg/L ($MB_{50WLaser}$ group); 3)SEI of mixed failure of dentin after treatment with methylene blue 50mg/L and red laser action ($MB_{50Laser}$ group); 4)SEI of mixed failure of dentin after treatment with methylene blue 100mg/L ($MB_{100WLaser}$ group); 5)SEI of adhesive failure of dentin after treatment with methylene blue 100mg/L and red laser action ($MB_{100Laser}$ group); 6)SEI of mixed failure of dentin after treatment with curcumin 500mg/L ($C_{500WLed}$ group); 7)SEI of adhesive failure of dentin after treatment with curcumin 500mg/L and blue LED action (C_{500Led} group); 8)SEI of mixed failure of dentin after treatment with curcumin 1000mg/L ($C_{1000WLed}$ group); 9)SEI of adhesive failure of dentin after treatment with curcumin 1000 mg/L and blue LED action ($C_{1000Led}$ group).

Materials, composition, and batch number of materials.

Material	Composition	Batch
Filtek Z350XT 3M ESPE	Bis-GMA, Bis-EMA, UDMA, TEGDMA, silica and zirconia nanofillers, and agglomerated zirconia-silica nanoclusters.	HB004209993
MTA Fillapex Angelus	Salicylate resin, natural resin, diluting resin, bismuth oxide, nanoparticulated silica, MTA and pigments.	36870
RelyX Ceramic Primer 3M ESPE	3-MPS, ethyl alcohol, water.	H0001504424
RelyX U200 3M ESPE	Base: glass fiber, methacrylate phosphoric acid esters, triethylene glycol dimethacrylate, silane-treated silica, sodium persulfate. Catalyst: glass fiber, substitute dimethacrylate, silane-treated silica, sodium p-toluenesulfonate, calcium.	1518200189

Bis-GMA, bisphenol-A diglycidyl ether dimethacrylate; Bis-EMA, ethoxylated bisphenol A glycol dimethacrylate; UDMA, urethane dimethacrylate; TEGDMA, triethylene glycol dimethacrylate; 3-MPS, 3-methacryloxypropyl-trimethoxy silane.

Mean ±standard deviation (MPa) values of push-out bond strength analysis of photosensitizers applied in photodynamic therapy, in different root thirds.

Bond Strength and Region	Cervical	Middle	Apical
Control Group	4.46 ±1.02 A a	4.04 ±2.39 A a	1.67 ±2.02 AB a
$MB_{50WLaser}$ Group	4.11 ±3.14 A a	2.73 ±5.81 A a	1.67 ±2.02 AB a
$MB_{50Laser}$ Group	3.14 ±4.01 A a	1.57 ±1.63 A a	2.45 ±2.46 AB a
$MB_{100WLaser}$ Group	1.67 ±2.03 A a	3.47 ±3.29 A a	1.62 ±1.51 AB a
$MB_{100Laser}$ Group	3.20 ±2.77 A a	1.48 ±1.27 A a	1.23 ±1.05 AB a
$C_{500WLed}$ Group	2.30 ±2.35 A a	2.40 ±2.99 A a	3.09 ±3.62 AB a
C_{500Led} Group	1.53 ±1.49 A a	1.68 ±1.23 A a	1.68 ±1.42 AB a
$C_{1000WLed}$ Group	0.91 ±0.64 A a	1.31 ±0.95 A a	0.67 ±0.61 B a
$C_{1000Led}$ Group	1.76 ±1.90 A a	0.94 ± 1.43 A a	0.50 ±0.43 B a

MB50WLaser, methylene blue 50 mg/L without red laser; MB50Laser, methylene blue 50 mg/L activated with red laser; MB100WLaser, methylene blue 100 mg/ L without red laser; MB100Laser, methylene blue 100 mg/L activated with red laser; C500WLed, curcumin 500 mg/L without blue LED; C500Led, curcumin 500 mg/L activated with blue LED; C1000WLed, curcumin 1000 mg/ L without blue LED; C1000Led, curcumin 1000 mg/L activated with blue LED.

Cdk5: a new player implicated in dental pain

N. Pinto Pardo[1,2], R. Sandoval[1], E. Couve[3], E. Utreras[1]
[1]Universidad de Chile, [2]Universidad de los Andes, [3]Universidad de Valparaíso

Objectives The cellular and molecular mechanisms involved in tooth pain are not totally understand. Currently, odontoblast theory as a noxious sensor cells is getting high relevance . We reported earlier that Cdk5, a key kinase implicates in orofacial pain, is upregulated by TGF-β1 in odontoblast-like cells, suggesting its possible role in tooth pain. In this study, our aim was to evaluate the expression and regulation of Cdk5 and its activator p35 by inflammatory mediators in both mouse dental cells and trigeminal neurons, and human teeth samples.
Methods By western blot and immunohistochemical analysis, we evaluated the effect of TNF-α and LPS treatments over Cdk5 and p35 protein expression both in primary cultures of mouse dental cells and in trigeminal sensory neurons. Moreover, by immunofluorescence we analyzed Cdk5-mediated TRPV1 phosphorylation (p-T407-TRPV1), an essential receptor-channel involved in pain signaling and a known Cdk5 substrate.
Results TNF-α and LPS treatments significantly increased expression of Cdk5 and p35 proteins, and p-T407-TRPV1 levels both in mouse dental cells and in trigeminal sensory neurons. Furthermore, by immunofluorescence we found for the first time that Cdk5, p35 and p-T407-TRPV1 were immunodetected in dentin-pulp complex from human teeth sections.
Conclusions Our results demonstrate that inflammatory mediators as TNF-α and LPS increase protein expression of Cdk5/p35 and Cdk5-mediated TRPV1 phosphorylation in odontoblast cells and trigeminal sensory neurons, suggesting that Cdk5 contributes to peripheral sensitization during tooth pain. Neurology

The PUFA/pufa Index in schoolchildren of the Maule Region.

K. Gambetta-Tessini[3,1], A. Ghanim[1], R. Marino[1], D. J. Manton[2]
[1]The University of Melbourne, [2]University of Melbourne, [3]University of Talca

Objectives The PUFA/pufa index relates to various pulpal and associated surrounding tissue complications of untreated carious lesions. This epidemiological information could be useful to identify children at risk of suffering pain and infection. Objective: To determine the PUFA/pufa index in schoolchildren from Talca city and to associate the index values with socio-economic variables.
Methods The sample was derived from primary schools. Socio-economics (i.e, sex, age, type of school, place of residency, type of health cover and reason for dental visit) information was collected and a single calibrated examiner performed a full mouth clinical evaluation. The PUFA/pufa experience was calculated in the same way as DMFT/dmft index. Code Pp: pulpal chamber visible or root fragments left. Code Uu: ulceration. Code Ff: fistula. Code Aa: Abscess. The PUFA + pufa prevalence was calculated as the proportion of the population reporting one or more teeth scored with a PUFA/pufa greater than zero. The PUFA/pufa ratio is the proportion of cavitated carious lesions that have progressed to a pulpal complication, calculated as [(PUFA+pufa)/(D+d)] x 100. Analyses included descriptive statistics, non-parametric bivariate analysis and binary regression models.
Results 577 children were examined. The PUFA and pufa for the sample population were 0.06 (s.d. 0.30) and 0.26 (s.d. 0.76), respectively. PUFA/pufa, PUFA/pufa ratio and PUFA/pufa prevalence were statistically different according to socio-economics. Children from public schools (OR=5.81, 95%CI 2.10-16.04, p<0.001) and those who visited the dentist only for emergencies (OR=4.81, 95%CI 2.79-8.29, p<0.001) had increased likelihood for PUFA/pufa prevalence.
Conclusions Despite the high caries experience reported in this region, the sequelae of untreated carious lesions seem moderate. However, the PUFA/pufa expressed marked inequalities in this sample. This evidence should be considered by health policy makers when developing oral health care programs, aiming at the relief of pain and infection amongst children.

Silver nano-sized associated with calcium glycerophosphate: antimicrobial/antibiofilm and cytotoxic potential

G. P. NUNES[1], J. S. Souza[1], A. S. Takamiya[4], F. N. Souza-Neto[3], D. B. Barbosa[4], E. R. Camargo[3], S. P. Oliveira[5], A. C. Delbem[2]

[1]School of Dentistry - São Paulo State University (UNESP), [2]UNESP, [3]Federal University of São Carlos, [4]São Paulo State University (UNESP), [5]São Paulo State University (UNESP)

Objectives The aim of this study was to investigate the antimicrobial/antibiofilm activities and the cell viability of silver nano-sized (AgNPs) obtained by a '*green*' synthesis associated or not to β-calcium glycerophosphate (CaGP) against *Streptococcus mutans* and *Candida albicans* in planktonic and biofilms states.

Methods AgNPs combined or not to CaGP (AgNPs-CaGP and AgNPs) were produced using pomegranate (*Punica granatum*) peel extract and characterized by UV-Visible, X-ray diffraction and transmission electron microscopy. Minimum Fungicidal/Bactericidal Concentrations (MFC and MBC) of the nanocomposites (AgNPs-CaGP and AgNPs) against *S. mutans* and *C. albicans* were determined by the microdilution method. Biofilms of *S. mutans* and *C. albicans* developed during 24 h were treated with nanocomposites for 24 h. After, the number of cultivable cells was quantified. In order to evaluate the cell viability, L929 cells were exposed to AgNPs-CaGP and AgNPs and, after 24, 48 and 72 hours, the cytotoxicity assay through MTT method was performed. Data were statistically examined by one-way ANOVA and Bonferroni/Kruskal-Wallis test (α=0.05).

Results Antimicrobial solutions synthesized in this study (AgNPs-CaGP and AgNPs) presented antimicrobial activity against tested microorganisms. After 24 h of treatment with the nanocompounds in *S. mutans* biofilms, there was a significant reduction in the number of CFUs being similar to chlorhexidine ($p < 0.001$). However, the nanocomposites were not effective against *C. albicans* biofilms. AgNPs-CaGP and AgNPs were not toxic to L929 cells in all analyzed periods even at higher concentrations (AgNPs-CaGP).

Conclusions Our results showed that AgNPs associated or not to CaGP presented antimicrobial/antibiofilm activity against the main microorganisms related to dental caries and candidiasis and were not toxic to the fibroblasts (L929).

Influence Of Omega-3 Supplementation On Inflammatory Response Of Endodontic Sealers

P. C. de Oliveira[1], M. d. Rodrigues[1], C. C. da Silva[1], L. C. Silva[1], L. C. Camacho[1], J. P. de Azevedo[1], H. A. Banci[2], D. M. Tavares[1], G. Sivieri-Araújo[1], R. Castilho Jacinto[1], E. Dezan-Junior[1], J. E. Gomes-Filho[1], L. T. Cintra[4]

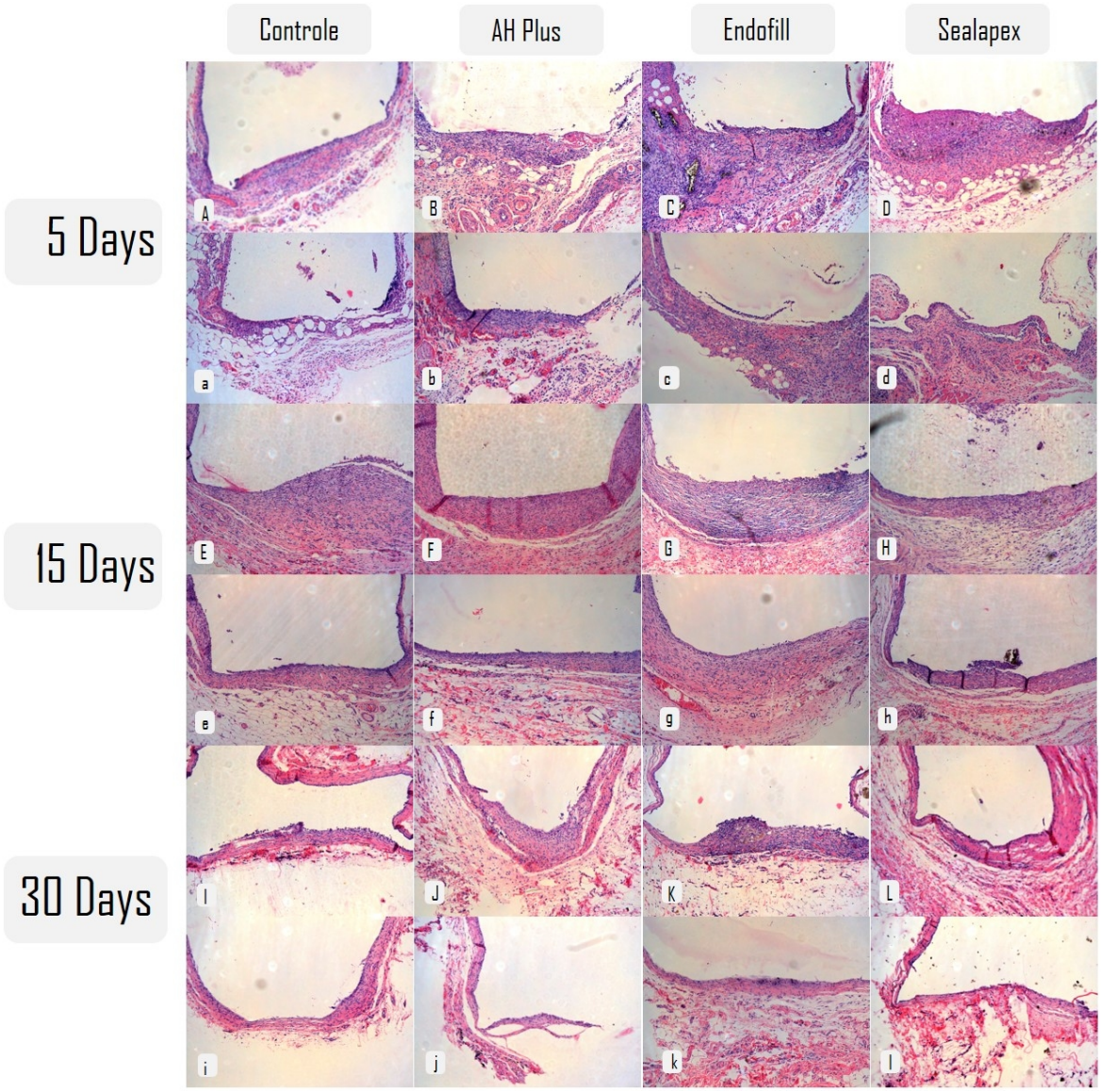
[1]São Paulo State University (UNESP), [2]São Paulo State University (Unesp), School of Dentistry, Araçatuba, [3]UNESP, [4]UNESP-Univ Estadual Paulista

Objectives The aim of this study was to evaluate the influence of omega-3 supplementation on inflammatory response of endodontic sealers.

Methods Forty-eight Wistar rats were assigned to three sealers groups (Sealapex, AH Plus and Endofill) and control group (empty tubes). These materials were placed in polyethylene tubes and implanted into the dorsal connective tissue of Wistar rats for 5, 15, and 30 days (n = 8). Half of the animals received omega-3 supplementation for 15 days before implantation and until the time of sacrifice. After each experimental time, the tubes and surrounding tissue were removed and processed for histological analysis in hematoxylin and eosin stained. The results were statistically analyzed ($p < 0.05$).

Results It was observed a lower inflammatory response in the animals supplemented with omega-3 in the 30-day period ($p < 0.001$). Among the no supplementation groups, there was no difference between the evaluated sealers in any of the analysis periods, however Endofill presented a more intense inflammatory infiltrate compared to the control group in the 30-day period ($p = 0.009$). Among the supplemented groups there was no statistical difference between the sealers. When comparing each sealer with or without supplementation, the sealers Sealapex ($p = 0.005$) and Endofill ($p = 0.001$) showed lower inflammatory infiltrate in the 30-day period.

Conclusions It was concluded that omega 3 supplementation influences the inflammatory response of Sealapex and Endofill endodontic sealers.



Inflammatory infiltrate caused by endodontics sealers in Control group (Images with capital letters) and Omega group (Images with small letters) for 05, 15 and 30 days.

Scores observed for inflammatory response of endodontic sealers and oral supplementation

Period of analysis	Score	H.E. Staining for Groups								Statistical analysis
		Control	Control + Ômega	AH Plus	AH Plus + Ômega	Endofill	Endofill + Ômega	Sealapex	Sealapex + Ômega	
5 days	1	0/8	0/8	0/8	0/8	0/8	0/8	0/8	0/8	*Kruskal-Wallis p=0.983 **Mann-Whitney p=0.451
	2	2/8	2/8	1/8	2/8	1/8	2/8	2/8	3/8	
	3	3/8	3/8	3/8	3/8	3/8	3/8	3/8	2/8	
	4	3/8	3/8	4/8	3/8	4/8	3/8	3/8	3/8	
	Median	3,5	3,5	4	3,5	4	3,5	3,5	3	
15 days	1	1/8	0/8	0/8	0/8	0/8	0/8	0/8	0/8	*Kruskal-Wallis p=0.212 **Mann-Whitney p=0.007
	2	1/8	5/8	2/8	4/8	1/8	4/8	2/8	5/8	
	3	4/8	3/8	5/8	3/8	4/8	3/8	6/8	3/8	
	4	2/8	0/8	1/8	1/8	3/8	1/8	0/8	0/8	
	Median	3	2	3	2	3	2	3	2	
30 days	1	3/8	7/8	2/8	2/8	0/8	3/8	0/8	5/8	*Kruskal-Wallis p<0.001 **Mann-Whitney p<0.001
	2	3/8	1/8	3/8	5/8	1/8	4/8	4/8	3/8	
	3	2/8	0/8	3/8	1/8	5/8	1/8	4/8	0/8	
	4	0/8	0/8	0/8	0/8	2/8	0/8	0/8	0/8	
	Median	$1,5^{AB}$	1^{A}	$2,5^{ABC}$	2^{AB}	3^{C}	2^{AB}	$2,5^{BC}$	1^{A}	

*Kruskal-Wallis for all eight groups **Mann-Whitney for two groups (ômega supplementation versus without ômega supplementation) Data expressed in form of median.

Artificial Intelligence Assisted Decision Making in Dentistry: What's Coming Next

A. Del Real, R. Oyonarte
Universidad de los Andes

Objectives Nowadays, practically every single area of knowledge is searching in the application of artificial intelligence (AI) in their processes, and dentistry is not an exception. The use of AI in dentistry has rapidly increased in the last few years, specially with the advent of Machine Learning, assisting in the radiographic detection of caries, diagnosis and prognosis of periodontally compromised teeth, automatic cephalometric analyses, among others. Thus, the objective of this study was to discuss the perspectives of Artificial Intelligence applications in dentistry, and to assess the capabilities of AI process to predict whether tooth extractions will be needed or not during an orthodontic treatment, in order to assist the orthodontist and general practitioner in the decision-making process.
Methods A sample of 149 orthodontically treated patients were included in this study, feeding 62 different variables from the initial cephalometric analysis and the clinical decision whether tooth extractions were performed or not during treatment. A prediction system was developed using the Machine Learning software Weka 3.8.3, based on the information of 100 of those 149 patients. The data of the remaining 49 was used as a test set.
Results The predictive system developed achieved a 75.51% of correct predictions and generated a Receiver Operating Characteristics (ROC) curves with an Area Under the Curve (AUC) of 0.843, achieving good accuracy.
Conclusions This machine learning-based model might assist orthodontists in the decision making of tooth extractions and general practitioners when asked by their patients.

Contextual and Individual Inequalities in Caries Experience: A Multilevel Analysis

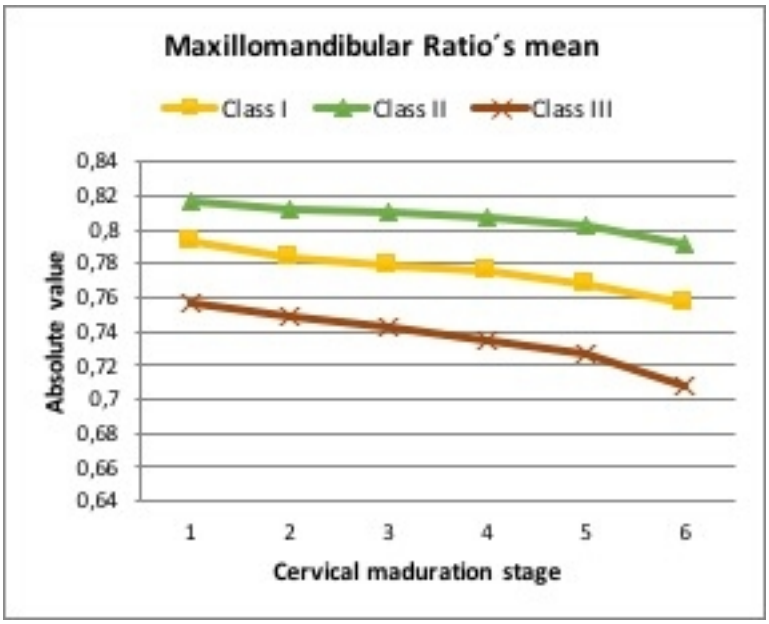
Y. Aravena Rivas[1], G. Espinoza[1], P. Muñoz[1], C. Atala[1], C. Zaror[1], P. Pineda[1], N. Figueiredo[1], A. Weitz[2], B. Hernández[2], J. F. Castillo[2], S. Muñoz[1]
[1]Universidad de La Frontera, [2]JUNAEB

Objectives To assess the effect of individual and contextual socioeconomic position in dental caries experience among children beneficiary of a nationwide school dental program.
Methods Data from Nationwide school dental programme by the National Board of School Aid and Scholarships (JUNAEB) dependent on the Ministry of Education were used in this cross-sectional study. The population corresponded to 185.643 children from pre-kinder to eighth grade of schooling. Explanatory variables included living in extreme poverty at individual-level and Human Development Index (HDI) at community-level. Outcomes studied were DMFT/dmft indexes for permanent and primary dentition. Covariates included sex, municipality rurality index and school grade as proxy of age. Three Poisson multilevel regression models were executed: first a null model with DMFT/dmft variable. Then, the crude association model between HDI and DMFT/dmft. Finally, a full model adjusted for all covariates. Afterwards, adjusted predictions of DMFT/dmft scores at representative values (mean age, mean rurality index and male sex) were calculated from the final model and expressed as probability graphs.
Results For permanent teeth, individuals from low HDI municipalities had 42% lower risk of caries experience (95%CI=18-59%) while for those belonging to medium and high HDI the relative risk was 41% lower (95%CI=17-58%). For primary teeth, compared to individuals living in very low HDI municipalities, those from low and medium HDI were likely to have a 66% (95%IC=50-76%) lower caries experience.
The lowest dmft predicted were non-poor children living in high HDI municipalities (2.24, 95%CI=2.07-2.40), while the highest dmft observed were for those living in very low HDI municipalities and living in extreme poverty (7.33, 95%CI=4.50-10.16). Similar results were observed for predicted DMFT.
Conclusions Contextual socioeconomic position was associated to caries experience in both dentitions. A social gradient in predicted dmft/DMFT by municipality HDI was observed regardless of individual socioeconomic position.

Maxillomandibular Ratio: Retrospective Cohort Cephalometric Study Of Untreated Caucasian Subjects.

M. Castro, R. Oyonarte, D. Vicuña
Universidad de los Andes

Objectives To analyze the evolution of maxillary and mandibular proportional growth in length expressed as the maxillomandibular ratio (RMxMd) in Northamerican Caucasian growing children. Also, to compare the differences in the values obtained from the RMxMd according to sagittal skeletal classification for each stage of cervical maturation, and to assess the predictive value of RMxMd for skeletal classification Northamerican Caucasian children.
Methods A longitudinal sample of the AAOF records (1) was obtained with profile teleradiographies of 231 patients (101 Class I, 83 Class II and 47 Class III), each one with at least three timepoints, including one prepuberal and postpuberal record according to their cervical maduration stage (CVS) (2). No statistical differences were found by sex, so the sample was treated unified. The skeletal Class was determined with the ANB angle at the last available record. RMxMd were recorded as maxillary length (Condylion- A point) divided by mandibular length (Condyleon-Gnation). A normal distribution of the data was verified with the Shapiro Wilk test. Descriptive statistics were obtained. ANOVA Test and post- hoc Bonferroni Test were used, and the predictive value of the RMxMd was evaluated.
Results RMxMd decreased with growth. The RMxMd's mean was significantly different (P value ≤ 0.05) among all skeletal classes and maturation stages. Class II had the greatest values, then Class I and finally Class III. At stages 1 and 2 of CVS, the positive predictive value of the RMxMd for Class III is 73%, and at stage 3 it is 77% for Class II.
Conclusions The RMxMd has a distinct evolution for each skeletal class starting from the initial prepubertal measurements. The RMxMd correctly classifies Class III individuals at prepubertal stages, and Class II individuals at circumpuberal stages, when the orthopedic treatment is more effective. RMxMd can become useful diagnostic tool for timely treatment of skeletal dysplasias.



Gingival Recessions and Periodontal Phenotype in Orthodontic Patients. A Pilot Study

C. herrera[1], K. Gambetta-Tessini[2], E. Bustamante[1], M. A. Rojas[1], M. Martinez[1], J. Jacques[3]
[1]Escuela de Odontología, Universidad de Talca, [2]Escuela de Odontología, Universidad de Talca, [3]Escuela de Odontología, Universidad de Talca

Objectives To evaluate the prevalence, distribution and severity of Gingival Recession (GR) according to the periodontal phenotype (PP) in orthodontically treated patients (OTP).
Methods An observational-retrospective study was carried out in 27 OTP. Evaluations included the revision of dental records, photographs and models before (T1) and at the end of treatment (T2). Subsequently, a clinical examination was also conducted (T3). Detected GR were registered, measured in mm and classified using the Miller's classification. The visual PP (vPP) was classified according to the gingival aspect in upper anterior teeth, as fine-scalloped (FS), thick-scalloped (TS) or thick-flat (TF) at T1, T2 and T3. The clinical PP (cPP) was classified in Thick (T) or Fine (F) according with the vestibular gingival thickness of the index teeth of Ramfjord, at T3.
Results Patients showed a GR prevalence of 44.4% (T1), 74,1% (T2) and 81.5% (T3), with an average of teeth with RG, per patient, increasing from T1 (n=1.37), T2 (n=32.67) to T3 (n=4.22). From 585 evaluated teeth, the most affected were tooth 4.4 and 3.1. The average GR depth increased from T1 (1.18mm) to T3 (1.33mm), where the 19% of RG were Miller III, at T3. A 30% of patients presented a vPP-FS which showed a higher average of teeth affected, compared with vPP-TS/TF. On the other hand, T-cPP prevalence was higher in upper molars (77.8%), while F-cPP prevalence was 88.9% in mandibular anterior teeth. Upper anterior teeth showed a F-cPP prevalence of 59.3%, disagreeing with vPP data. Finally, the F-cPP showed both a higher prevalence and average of teeth affected, compared with T-cPP, particulary in lower anterior teeth.
Conclusions There is a trend to develop GR in OTP, may be related to the PP. Further research is necessary to confirm these primary results and to identify PP interaction with the type of dentomaxillary anomaly of patients, the degree of arch expansion or the teeth pro-inclination.

Encapsulated Mesenchymal Stem Cells in Endodontic: A Randomized Clinical Trial

c. brizuela, G. Meza, C. Inostroza, M. Khoury, D. Urrejola, G. Besamat
Universidad de los Andes

Objectives The aim of this study was to evaluate the safety and efficacy of encapsulated human umbilical cord mesenchymal stem cells (hUC-MSCs) in a plasma-derived biomaterial for regenerative endodontic procedure (REP) in permanent teeth with apical lesions
Methods A randomized clinical trial was conducted that included 36 patients with mature incisors, canines or mandibular premolars showing pulp necrosis and radiographic evidence of apical periodontitis. The patients were randomly allocated (1:1) to the REP group or conventional root canal treatment (ENDO group). At the first visit, the access cavity was established and mechanical preparation of the root canal was performed. Calcium hydroxide medication was put into the canal and the cavity was sealed with glass ionomer. Three weeks after the first visit, the ENDO and REP groups each followed a specific protocol. Clinical follow-up examinations were performed at 1 week, 6 months and 1 year. The chi-square test of independence and Fisher's exact test were used for analysis
Results At the 1-year follow-up examination, no adverse events were reported and the patients showed 100% clinical success in both groups. In the REP group, laser Doppler flowmetry revealed a significant increase of 22.2 times in unit perfusion (UP) percentage between baseline and 1 year of follow-up ($p<0.05$). Sensitivity tests revealed an increase in the positive pulp response in the REP group from baseline to 1 year of follow-up
Conclusions hUC-MSCs encapsulated in a plasma-derived biomaterial are a safe, effective and innovative alternative treatment based on biological principles that promote dentin–pulp regeneration and the health of periapical tissue

Figure.2

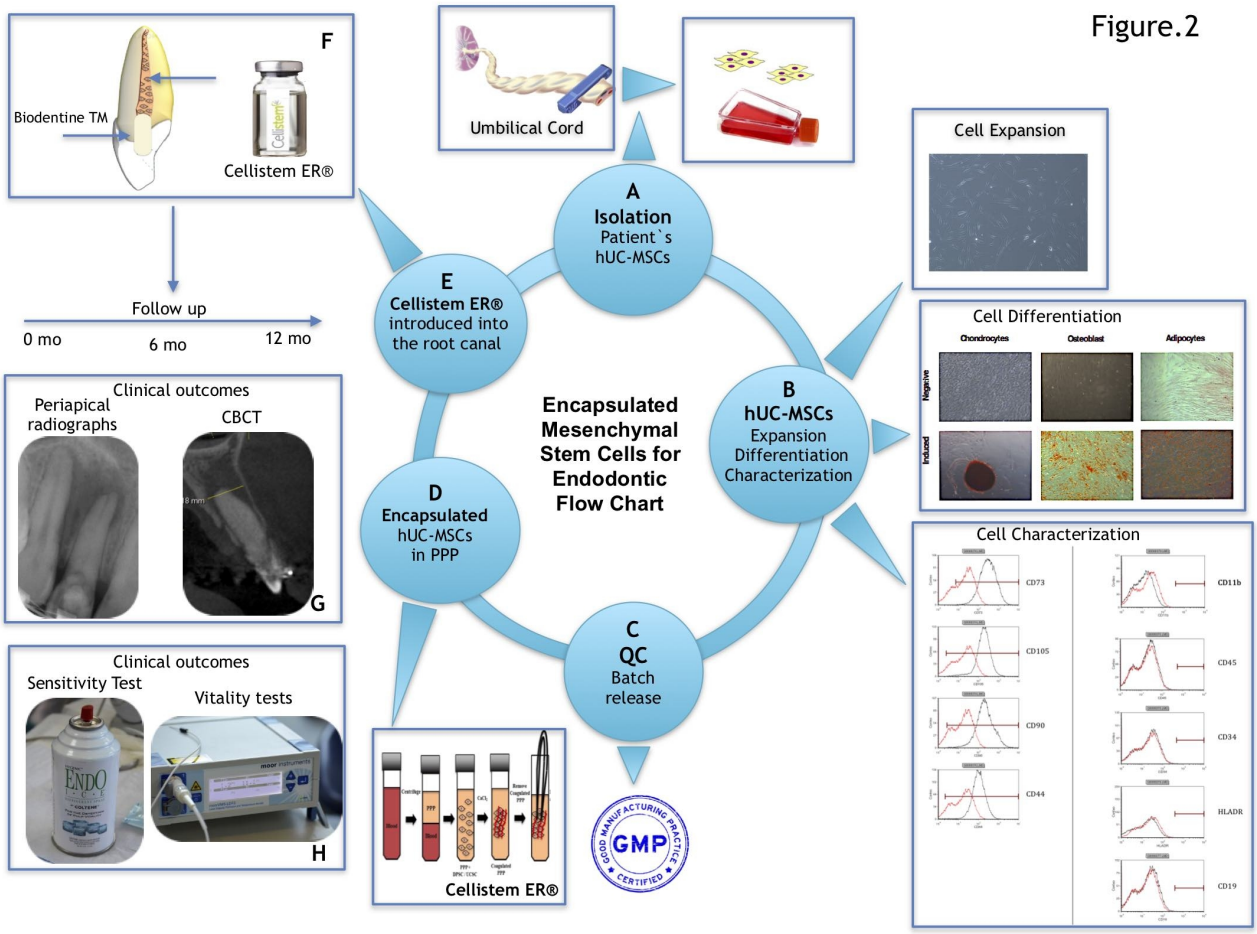


Figure 2. Flow chart.

Nitrous Oxide Sedation Reduce Sessions And Cortisol Levels In Children.

P. Aravena Torres[1], C. Mautz[1], C. Rodriguez-Salinas[1], B. Benso[2]

[1]Universidad Austral de Chile, [2]Pontificia Universidad Católica de Chile

Objectives To assess the pharmacological effectiveness of nItrous oxide sedation (NOS) compared to cognitive behavioral therapy (CBT) in dental treatments of anxious children by evaluating the number of sessions and attention time required for dental discharge and psychometric and physiological parameters of anxiety.

Methods A radomized clinical trial was designed in patients classified as anxious [Face Image Scale (FIS)] randomized in two groups: NOS (25 children, 6.44 ± 1.6 years; 70.83% men) treated with inhalation of gas mixture 10 -70%: 90-30% nitrous oxide: oxygen; and CBT group (24 children, 6.62 ± 2.01 age, 36% men). The number of sessions required for dental discharge and anxiety indices of children with FIS scale, FRANK scale and salivary cortisol levels (chi-square, T-test, two-way ANOVA and Sidak's test) were analyzed.

Results For the dental discharge group NOS performed a total of 96 attentions (average 3.92 ± 2.33) versus CBT with 129 attentions (5.38 ± 2.68; p = 0.04). The FIS and FRANK scales were shown to decrease anxiety levels in both treatment groups. The NOS group presented at the beginning and at the end of the treatment lower expressions of the cortisol stress marker (mean 26.8 nmol / L) compared with CBT (mean 38.8 nmol / L; p = 0.04). According of number of chidren with treatment completed, the NOS showed a NNT = 2.39 (95% CI = 1.63-552)

Conclusions The NOS has proven to be an effective treatment method in the comprehensive care of anxious pediatric pediatric patients and may be indicated as an alternative therapy to patients who do not respond to CBT conventional therapy.

Are we representing dental caries with *in vitro* models?

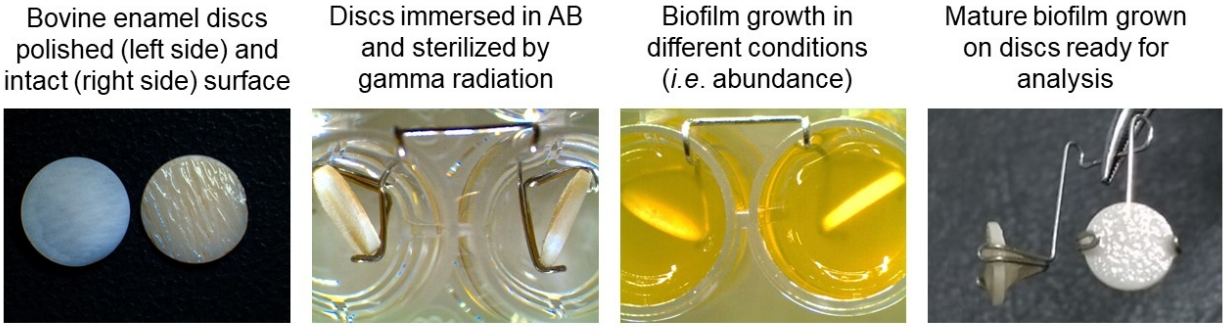
E. J. Florez Salamanca[1], R. M. Dantas[1], M. J. Rodriguez[2], M. I. Klein[1]
[1]São Paulo State University (UNESP), [2]Universityersidad Santo Tomas

Objectives A challenge is to achieve models with a progressive (not drastic) transition of the oral microbiota going from commensal to pathogenic biofilm, to have a better understanding of dental caries as an ecological process. The present study aimed to create a model in which oral conditions were mimicked, and four factors were included: enamel as a substrate, a heterogeneous inoculum, an intermittent administration of sucrose and starch (simulating food intakes), and the time during which these factors interact to demineralize teeth surface as occur in dental caries effectively.

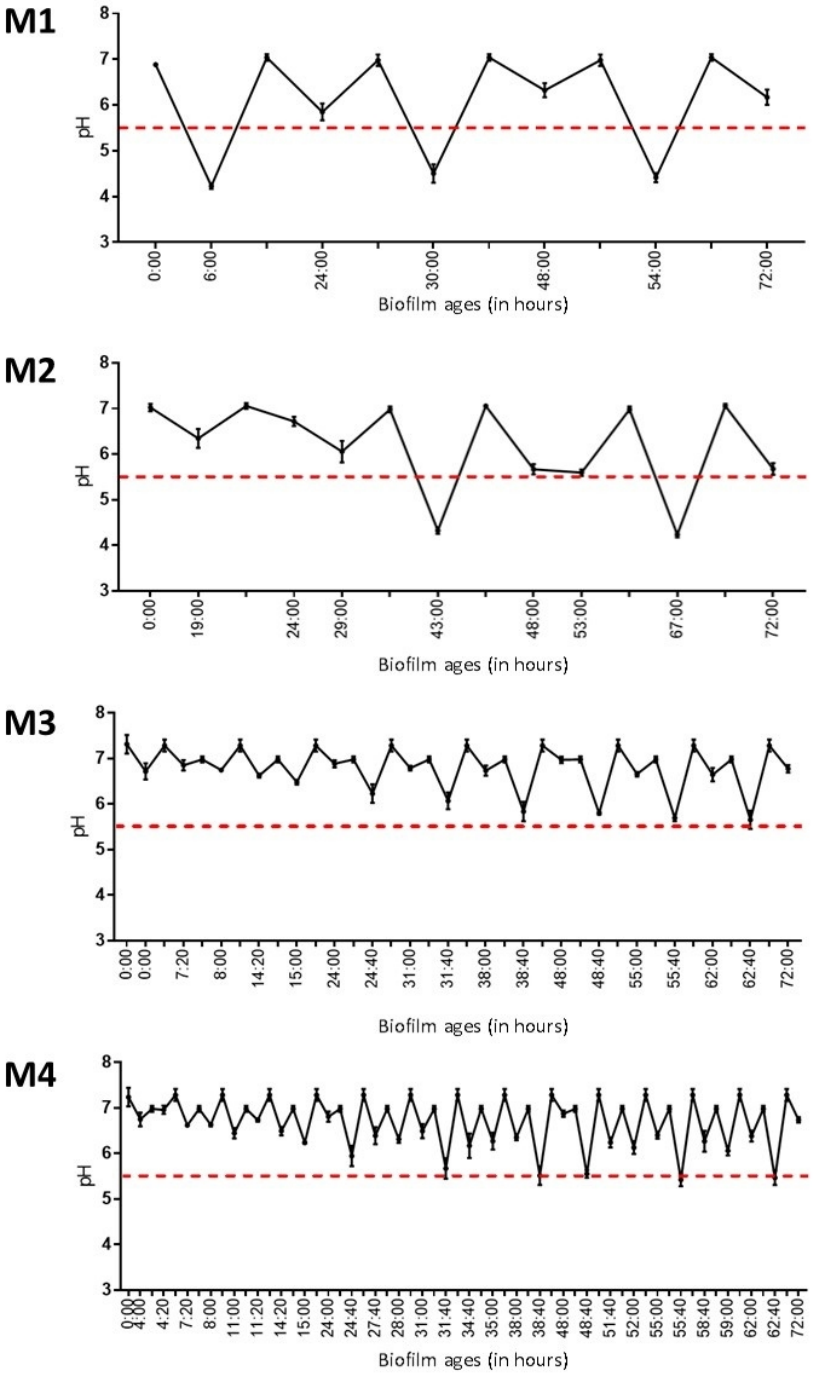
Methods Seventy-two bovine enamel discs (Institutional Ethics Committee, CEUA: no 03/2018) sterilized by gamma irradiation (25 KGr) were used for the study where microcosm biofilms (inoculated with human saliva of nine volunteers, Institutional Ethics Committee, CAAE: 82750117.6.0000.5416) were grown in four experimental conditions: Feast and Famine (M1), Abundance and scarcity (M2), Three meals daily (M3), and Three meals plus two snacks daily (M4) (Figure 1). The experiments were carried out for three days. The pH of spent culture media was checked, and discs were removed after 24, 48 and 72h of biofilm growth to analyze the biofilms (biomass, total microbiota, mutans group streptococci) and the disc traits (microhardness and roughness). Variables were analyzed longitudinally for the four experimental groups. Data of all biofilm types were compared using two-way analysis of variance with Tuckey's post-test to clarify whether exist a similar behavior inside and among biofilm models over time ($\alpha \leq 0{,}05$).

Results Two major behaviors were observed: groups M1 and M2 promoted an acid environment, groups M3 and M4 maintained a pH closer to the neutral (Figure 2). The demineralization process was slower in the neutral groups (Figure 3); also, a greater increase of microbiota and biomass was observed over time.

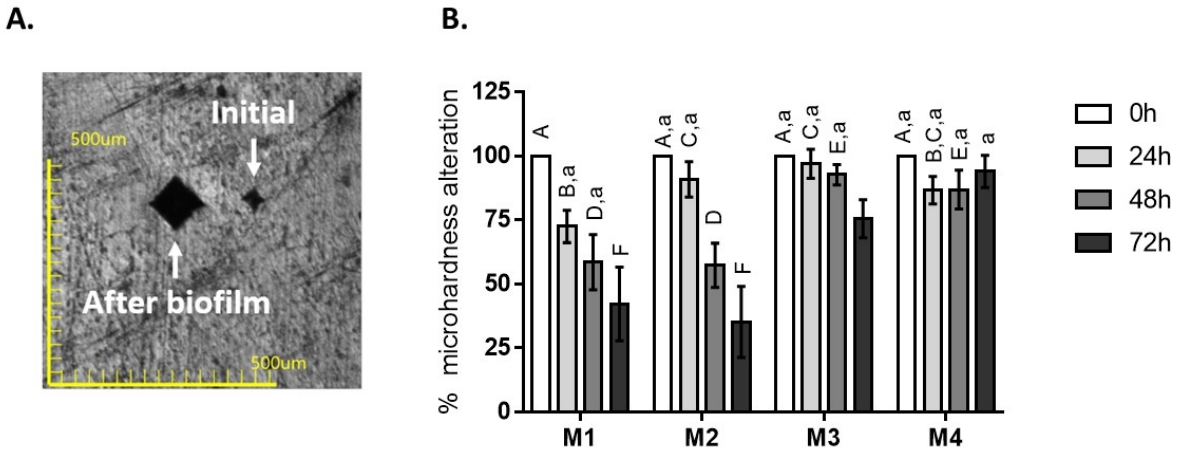
Conclusions In general, the groups M3 and M4 were better in mimicking the oral environment, having more characteristics similar to those found in vivo (lower pH drops, not drastic enamel demineralization, and possibly conservation of a more diverse microbiota). Thus, future studies should be carried out with additional analyses.



Microcosm biofilm formation.



Culture media pH behavior of four biofilm models.



Mechanical characteristic of enamel surface.

Interleukin-35 inhibits alveolar bone resorption during periodontitis by modulating the Treg/Th17 imbalance.

E. A. Cafferata Chea[1], C. Terraza[1], R. Barrera[1], N. Faúndez[1], N. González[1], B. Cortés[2,3], C. Cortez Plaza[2,3], R. Vernal[1], S. Melgar-Rodríguez[1], C. Rojas[1]

[1]Universidad de Chile, [2]Faculty of Sciences, Center for Integrative Biology, Universidad Mayor, [3]Faculty of Sciences, Center for Genomic and Bioinformatic, Universidad Mayor

Objectives Periodontitis is a chronic inflammatory disease, in which the locally deployed immune response against a dysbiotic subgingival microbiome results in alveolar bone resorption and tooth loss. In this context, the Th17 pattern of immune response has been associated to the increase of RANKL:OPG levels and consequently osteoclasts over-activation during periodontitis; otherwise, the T regulatory (Treg) response, has been associated to the regulation of the Th17 response and inhibition of periodontitis progression. Interleukin (IL)-35 is a recently described cytokine mostly produced by Tregs, with exclusive immunoregulatory properties, and with the ability to induce its own expression and production in Tregs; nevertheless, its role during periodontitis remains undetermined. Therefore, this work aimed to elucidate the potential protective role of IL-35 during experimental periodontitis.

Methods Experimental periodontitis was induced in C57BL/6 mice using silk ligatures. Then, ligated mice received palatal or intraperitoneal injections of IL-35 every other day for 15 days. Sham-injected and non-ligated mice were used as controls. Alveolar bone resorption was analyzed using micro-CT and scanning electron microscopy (SEM), and differentiated osteoclasts were detected by TRAP staining. RANKL:OPG levels were detected by ELISA in crevicular fluid, and their expression levels were quantified by qPCR and immunofluorescence of periodontal lesions. The proportion of Tregs and Th17 lymphocytes in draining lymph nodes and periodontal lesions was determined by flow cytometry, and the expression of Treg- or Th17-related cytokines was quantified by qPCR.

Results IL-35 inoculations diminished alveolar bone resorption, TRAP+osteoclast detection, RANKL:OPG expression and production, Th17 lymphocytes detection, Th17-associated cytokines, and receptors expression, and further increased Tregs detection and Treg-related cytokines expression in comparison with the sham-injected group.

Conclusions IL-35 was able to arrest experimental periodontitis by inhibiting alveolar bone resorption and modulating the Treg/Th17 imbalance and could be potentially used as a novel therapy for periodontitis.

Morphological changes of different phenotypes during craniofacial growth.

D. Becerra[2], D. Vicuña[2], F. P. Keith Álvarez[1], V. Risso[2], F. Biskupovic[3], J. A. Briceño Risso[2]
[1]Universidad San Sebastian, [2]Universidad de los Andes, [3]Universidad de los Andes

Objectives The growth pattern of hyperdivergents craniofacial phenotype is established early at 6 years age[1]. Is reported that 64% of hyperdivergents of 6 years, remain at 15 with the same phenotype, with a 25% worsening[2]. These patients are difficult to treat in orthodontics, so it is important to diagnose them early and try to intercept this growing pattern. The aim of this study is to describe the morphological changes that occur during growth in normo (N), hypo (A) and hyperdivergent (H) phenotypes.

Methods 316 teleradiographs were measured cephalometrically. This study was approved by the scientific and ethical board of Universidad de los Andes, Chile. 27 cephalometric variables were measured in 6 groups of cervical maturation stages[3]. A descriptive analysis (measures of central tendency and dispersion) and an ANOVA between the phenotypes N, A and H within each maturation group for each variable were performed (SPSS®).

Results Significant differences were found in all skeletal maturation groups except group 6 for lack of a minimum of subjects. The most important and discussed variables were: Goniac angle (P= 0,000), ramus height (p= 0,004), chin projection (p=0,021), ANB (p= 0,009), SNA (p= 0,008), SNB (p= 0,000) (table 1).

Conclusions Goniac angle is higher in hyperdivergent during growth, while mandibular ramus is significantly smaller. Chin projection in hyperdivergent is significantly lower than the rest of phenotypes but, after pubertal peak there is an increase in hypodivergents, probably because mandibular rotation during its growth[2,4,5] (while hyperdivergent tends to worsen after the peak). A difference in ANB during the peak between hypo and hyperdivergent was observed, in which turns to be greater in hyper. SNA and SNB decreases significantly in hyperdivergents as it is stablished in literature[2], but after acceleration and pubertal peak we see how in hypodivergent increase SNB significantly while hyperdivergents remains constant.

ANOVA for Phenotypes A, H, N (IC 95%)

	CVM1	CVM2	CVM3	CVM4	CVM5
Goniac angle	p= 0,000*	p= 0,000*	p= 0,001*	p= 0,006*	p= 0,407
Chin projection	p= 0,024*	p= 0,022*	p= 0,035*	p= 0,003*	p= 0,285
Ramus Heigth	p= 0,000*	p= 0,028*	p= 0,004*	p= 0,029*	p= 0,098
ANB	p= 0,039*	p= 0,514	p= 0,009*	P= 0,319	p= 0,491
SNA	p= 0,000*	p= 0,000*	p= 0,008*	p= 0,001*	p= 0,337
SNB	p= 0,000*	p= 0,000*	p= 0,000*	p= 0,000*	P= 0,124

* SSD < 0.05

Association Between Lymphocyte B-Chemotactic Cytokine Levels in Gingival Crevicular Peri-Implant Fluid and Peri-Implant Diagnosis.

M. Bendek Viera[1], D. Albers[2], O. Reallini[1], V. Beltrán[3], A. Chaparro[1]
[1]Universidad de los Andes, [2]Universidad Mayor, [3]Universidad de la Frontera

Objectives To explore the levels and association between lymphocyte B-chemotactic cytokines in gingival crevicular peri-implant fluid and the peri-implant diagnosis.
Methods Patients that were receiving periodontal maintenance therapy for dental implants were recruited at Dental Health Center of the Universidad de la Frontera, Temuco, Chile. The Ethics Committee of the Universidad de la Frontera approved the present study and all participants signed an informed consent. Clinical assessment was performed by a single operator and included complete periodontal and peri-implant diagnosis: gingival health (GH), peri-mucositis (PM) and peri-implantitis (PI), periodontal pocket depth (PPD), bleeding on probing (BOP), suppuration, time of implant placement, bacterial plaque percentage (BPP), periodontal disease history and cigarette smoking. The sample of gingival crevicular peri-implant fluid (GCPIF) was processed by Luminex® for quantification of chemokine C-C motif ligand 20 (CCL-20), proliferation-inducing-ligand (APRIL), B-cell activating factor (BAFF-BLYS), interleukin 23 (IL-23), Receptor activator of nuclear factor kappa-β ligand (RANK-L) and osteoprotegerin (OPG), (pg/ml). Data was analyzed by descriptive statistics, Kruskall-Wallis and Spearman's correlation tests.
Results A total of 12 subjects were recruited with 48 implants, of them: 16 implants were diagnosed with GH, 16 PM and 16 PI. From the clinical records: positive history of periodontal disease (*p-value*=0.014), current periodontal disease (*p-value*=0.001), BOP (*p-value*=0.013), BPP (*p-value*=0.018), PPD (*p-value*=0.0001) were significantly associated to peri-implant diagnosis. Among the panel of cytokines, CCL20 had a median value of 50.24 (IQR=93.42), APRIL 161.46 (IQR=216.15), BAFF-BLYS 9.7 (IQR=10.262), IL-23 143.65 (IQR=153.575), RANK-L 606.78 (IQR=158.86) and OPG=1701 (IQR=1683.5), pg/ml. However, only APRIL was significantly associated to PM (*p-value*=0.008) and PI (*p-value*=0.0008).
Conclusions This study employed a novel technology for simultaneous cytokine quantification in GCPIF. APRIL, a lymphocyte B-chemoattractant cytokine, was increased in PI and PM, suggesting a mechanism of B-cell activation via RANK-L. Further investigations are required to elucidate this link and assess APRIL as a potential biomarker of tissue destruction in PI and PM.

Silver diamine fluoride versus atraumatic restorative treatment for caries arrest

F. Verdugo[1,2], D. Ortuño[3], J. Vargas[3], M. Uribe[3]
[1]Pontificia Universidad Católica de Chile, [2]Epistemonikos Fundation, [3]Pontificia Universidad Católica de Chile

Objectives Identify and analyze data of all existing evidence in Epistemonikos about the effectiveness and safety of silver diamine fluoride (SDF) compared to atraumatic restorative treatment (ART) for caries treatment in temporal and mixed dentition.
Methods We performed a search in Epistemonikos, the largest database of systematic reviews (SRs) in health, which is maintained by screening in multiple information sources, including Pubmed/Medline, Embase, Cochrane, among other. We included systematic review that compared silver diamine fluoride with atraumatic restorative treatment for caries arresting in children. We did not impose any restriction on language, country or published status. We extracted data from SRs, renalyzed data of primary studies, conducted a metanalysis and generated a summary of findings table using GRADE approach. All process were duplicated and reviewed by methodological and clinical team.
Results We found 9 SRs, that included only 2 randomized clinical trials (RCT). Trials included children between 3 and 6 years old with cavitated caries without pulp involvement. Both RCT included 303 patients where the unit of analysis were teeth (n=953).
Silver diamine fluoride compared to the atraumatic restorative treatment may improve the arrest of caries lesion in primary and mixed dentition (low certainty evidence) (RR 1.19, 0.94 to 1.50). We are uncertain whether silver diamine fluoride improves adverse events as the certainty of the evidence has been assessed as very low. No studies were found that looked at patient preferences.
Conclusions The SDF has proven to be effective for the arrest of caries, avoiding the performance of more invasive clinical actions. However, there is uncertainty about its adverse effects. New RCTs are required to evaluate the effectiveness, safety and preferences of patients regarding this intervention.

SURFACE MODIFICATION IMPROVES BONE HEALING AROUND TIALV ALLOY IMPLANTS

H. Hadad, L. T. Colombo, A. Piquera Santos, L. K. Jesus, F. Ávila Souza
Sao Paulo State University

Objectives The aim of this study was to evaluate the biological behavior of bone tissue around implants manufactured in Ti-6Al-4V alloy before surfaces modified by aluminum oxide blasting followed by acid etching (SBAS) and machined surface (MS).
Methods Ten rabbits received 20 external hexagon implants (4.0x10mm) on their right and left tibia, one implant of each surface on each tibia. The implants were analyzed by scanning electron microscopy (SEM-EDX) and atomic force microscopy (AFM). Disks with the same surfaces were submitted to analysis of average roughness (Ra) and cross section. In the periods of 3 and 6 weeks, the primary stability coefficient was measured by means of resonance frequency analysis (ISQ), followed by euthanasia of the animals. The bone interface contact (BIC) and newformed bone area (NBA) was measured in percentage. Data were submitted to analysis of variance and Tukey t test.
Results SEM and AFM showed differences in the implant surface. Both the ISQ and the average roughness and even the cross section analyzes
for SBAS were statistically higher ($p < 0.05$) when compared to MS. BIC in percentage for SBAS (69.65 and 71.56 respectively for 3 and 6 weeks) were better than MS (54.06 and 55.99), as well as NBA also shower better results for SBAS (69.86 and 79.59 for the 3 and 6 week periods) when compared with MS (59.59 and 74.32). There were statistically differences ($p < 0.05$) in SBAS implants for BIC in the 3 and 6 week periods and NBA in the 3 week period.
Conclusions The SBAS implants provided changes in the topography of the implants, promoting a better contact between bone tissue and titanium alloy, allowing better levels of osseointegration.

In Vitro Evaluation of the Debridement Efficacy: A comparative Study Using Passive Ultrasonic Irrigation with Different Apical Diameters

J. Osorio, m. alcota, c. diaz, a. ortega, c. peñafiel, f. gonzalez
University of Chile

Objectives To evaluate the elimination of organic tissue after the instrumentation of narrow, infected and curved root canals with an apical enlargement of 25 and 35 with or without passive ultrasonic irrigation.
Methods 54 messiobucal canals from mandibular first molars with curvatures between 10 and 25 degrees were used. The samples were dividedin three groups, Group 1: 24 root canals instrumented with Race system in 04 taper up to an apical diameter of 25; Group 2: 24 root canals instrumented with Race system in 04 taper up an apical diameter of 35; Group 3: 5 non instrumented root canals as a control group. Groups 1 and 2 was farther divided in two subgroups of 12 samples each: Groups 1A and 2A were activated with passive ultrasonic irrigation (PUI), and groups 1B and 2B with conventional irrigation using syringes. Teeth were demineralized and included in paraffin and then perpendiculary cutted at 2 and 4 mm from the apex in 6 micrometers thickness slices. The root transversal samples were analyzed with a light microscope and the root canal cleanness was evaluated using a 0 to 3 score scale.
Results When PUI was used, there was a pronounced reduction of the organic remnant in the apical enlargements of 25 and 35 without significant differences ($p = 0.5$). The amount of organic remnant found into the root canals after instrumentation with an apical enlargement of 25 and 35 using conventional irrigation with syringes showed a significantly pronounced reduction only in apical enlargement 35 ($p = 0.02$)
Conclusions The using of PUI reduced the organic material of narrow infected and curved root canals with apical enlargement of 25 or 35. When PUI is not used, a biomechanical instrumentation up to a diameter >35 in narrow infected root canals it is recomended.

Oral Health And Self-Efficacy In Pregnant Women Attended In Primary Care

M. Rios-Erazo[1], M. Rojas Aliaga[1], A. Herrera Ronda[1], P. Barahona Salazar[1], J. Vivanco Pizarro[2], G. Rojas-Alcayaga[1]
[1]Universidad de Chile, [2]CESFAM Vista Hermosa

Objectives Self-efficacy in oral health has become relevant in explaining the development and/or modulation of health/disease states. This determinant of health acquires even more relevance in high-risk groups such as pregnant women. Thus, the objective of this study is to determine the influence of self-efficacy on the oral health of pregnant women at a primary health care center in Puente Alto, Santiago, Chile.
Methods Non-experimental, cross-sectional and correlational study. 50 pregnant women enrolled at the GES program (Explicit Health Guarantees program) at the primary health care center Vista Hermosa were assessed. The oral health self-efficacy was measured through the AMS test. Oral health status was assessed by two calibrated dentists using DMFT, OHI and GI. Descriptive and correlational statistics were performed using Spearman and Pearson's correlation coefficient, with an error of 5%.
Results The average age of the participants was 28.6 years. An average score for oral health self-efficacy of 31.91 was found. Regarding oral health indicators, an average of 7.5, 0.64 and 0.60 was obtained for DMFT, gingival index and oral hygiene index respectively.
No significant relationship was found between oral health self-efficacy (r= 0.151; p = 0.299), tooth brushing (r = 0.187; p = 0.198) and visits to the dentist (r = 0.070; p = 0.632) with DMFT, but there is a significant and inverse relationship between the caries component of DMFT and self-efficacy in total oral health (rho = -0.361; p= 0.011). Moreover, a significant and inverse relationship was found between self-efficacy for tooth brushing with OHI (rho = -0.323; p= 0.027), but not with GI (rho = -0.237; p = 0.101).
Conclusions There is no significant association between oral health self-efficacy with DMFT and GI oral health status indicators, although it does have associations with the OHI indicator and the caries component.

Reliable Method for Quantitative SPECT for Temporomandibular Joint. Preliminary Study

H. Gonzalez-Oneto[1], D. Vicentini[2], R. Goya[1], I. Hermosilla[1], C. Zepeda[2]
[1]Universidad Catolica de Chile, [2]Universidad Catolica de Chile

Objectives Development of a standardized, reliable and reproducible processing method for quantitative temporomandibular joint single photon emission computedtomography (TMJ-SPECT).
Methods TMJ-SPECT images were obtained from nine subjects who underwent bone scintigraphy for a medical reason other than pathology. The inclusion criteria were ages 10 to 30 year, full dentition and no orthodontic treatment. The exclusion criteria were no previous history or current signs of TMD, metabolic, degenerative, autoimmune diseases, facial asymmetry or cancer. TMJ pathology was ruled out by an odontologist, who performed clinical examination. SPECT images were processed by two nuclear medicine physicians. Axial slices were selected using three methods: single slice, sum of three slices and sum of all slices containing the TMJs. Elliptical ROIs were drawn aroundTMJs, using either area or number of pixels for symmetry. Uptake percentages were calculated using total and maximum counts. As an alternative to maximum counts, which rely on a single pixel, a “peak counts” method was also developed by centering 9-pixel circular ROIs at the maximum uptake spot in the 3-slice summed image. Lin's concordance correlation coefficient and Pearson correlation were used for interobserver and visual agreement, respectively.
Results : Maximum or peak counts for percentage calculation resulted in best interobserver agreement and statistically significant correlation with visual inspection, without significant differences between number of slices and ROI symmetry methods. Total counts showed poor concordance when ROI area was used for symmetry (Lin’scoefficient = 0.38).
Conclusions Best reproducibility and visual correlation were obtained using maximum or peak counts methods (*PROM-EQUAT*), without a significant difference between the number of slices used and ROI symmetry methods. The traditional “total counts and equal areas” approach showed the poorest performance. This analysis suggests using peak counts as potential standardized method, as it is easier and less operator-dependent than multiple slice selection or total counts measurement

Statistical comparison between processing methods

	ROI symmetry	ROI symmetry	Interobserver concordance †	Visual correlation (p-value) §
Single slice	Area	Total counts	0.72	0.71 (0.03)
		Maximum counts	0.87	0.98 (<0.001)
	Pixel	Total counts	0.86	0.97 (<0.001)
		Maximum counts	0.87	0.98 (<0.001)
3 slices	Area	Total counts	0.38	0.87 (0.002)
		Maximum counts	0.86	0.98 (<0.001)
	Pixel	Total counts	0.83	0.98 (<0.001)
		Maximum counts	0.87	0.98 (<0.001)
	Peak (pixel)	Peak counts	0.87	0.98 (<0.001)
All slices	Area	Total counts	0.38	0.82 (0.006)
		Maximum counts	0.87	0.99 (<0.001)
	Pixel	Total counts	0.87	0.99 (<0.001)
		Maximum counts	0.87	0.98 (<0.001)

† Lin's concordance correlation coefficient. § Pearson's correlation coefficient.

Association between dental anxiety and oral health among pregnant women

A. C. Herrera Ronda[1], F. Troncoso Sepúlveda[1], P. Barahona Salazar[1], J. Vivanco Pizarro[1], G. Rojas-Alcayaga[1], M. Rios-Erazo[2,1]
[1]Universidad de Chile, [2]Universidad de Chile

Objectives Dental anxiety negatively affects oral health and the quality of life of the people who suffer from it. Pregnant women constitute a risk group as they are more susceptible to developing oral diseases and because of the higher rates of anxiety and depression that characterize this period. The ways in which dental anxiety affect pregnant women have been sparsely studied. The aim of this study was to examine the association between dental anxiety and the oral health status of pregnant women at a primary health care center in Puente Alto, Santiago, Chile.
Methods In this cross sectional and correlational study 50 pregnant women enrolled at the GES program (Explicit Health Guarantees program) at the primary health care center Vista Hermosa were assessed. Dental anxiety was evaluated by means of IDAF-4C+ and oral health status was assessed by two calibrated dentists using DMFT, OHI and GI. Descriptive statistics and Spearman correlation were used to analyze data.
Results 10,2% of respondents reported moderate dental anxiety and 22,4%, dental phobia. Average DMFT of the pregnant women was 7,5. 52% of them showed a good gingival condition and 77% an optimal oral hygiene. A significant correlation was observed between dental anxiety and DMFT (rho = 0,31 p<0,05), and also between dental anxiety and the "Decayed" component (rho = 0,4 p<0,05). No significant correlation among OHI (rho = 0,22 p>0,05), GI (rho = 0,17 p>0,05) and dental anxiety were observed.

Conclusions There is a significant association between dental anxiety and DMFT among pregnant women. Higher scores of dental anxiety were associated to higher DMFT scores and caries prevalence.

Comparison of Approximal Carious Lesions Detection in Primary Molars

J. Botelho[1], N. Durán[2], C. Antinovic[2], K. Gambetta[1]
[1]University of Talca, [2]University of Talca

Objectives Approximal carious lesions are difficult to detect. Visual inspection (VI) complemented with bitewings radiographs (BW) are the most used methods as a routine diagnostic approach. However, both methods combined can underestimate lesion cavitation. Aim: To compare the ability of three different methods to detect cavitation in approximal surfaces: VI, BW and VI after tooth separation using orthodontic rubber rings (ORR), with the latter considered as gold standard.
Methods This cross-sectional study examined approximal surfaces in primary molars of 6-to-11-year-old children attending dental clinic of the University of Talca. VI was performed by using ICDAS criteria and caries risk assessment was evaluated by employing Cariogram model. The mesial and distal surfaces were classified radiographically according to ADA Caries Classification System (E1 to D3). If lesions did not show a clear diagnosis of cavitation using these two methods, final diagnosis was defined by the teeth separation using ORR. Analyses included descriptive information and cross-tabulation of data per patient and per surface.
Results A total of 122 approximal surfaces from 39 patients were examined with an average age of 8.00 (±0.22) years. The DMFT and dmft of the sample were 1.64 (±0.25) and 5.49 (±0.41), respectively. All children were at a high caries-risk. From all examined surfaces, 33% had a carious ICDAS code (2 to 6), and the most prevalent code encountered was 6 (8.7%; n=46) followed by code 4 (6.0%; n=32). Twenty-seven surfaces were evaluated after dental separation using ORR. Five of those surfaces (19%) were classified as ICDAS code 4 (VI) and D1 (BW), however they were not cavitated.
Conclusions One of five surfaces, that would probably receive invasive treatment, could be managed with non-invasive therapies. In case of diagnostic doubts, tooth separation using ORR should be used to verify the cavitation status of the approximal carious lesions.

Epigenetic regulation of TLR2-mediated inflammation in extra-radicular infection

A. Fernandez[3,1], J. Astorga[1], C. Rodriguez[3], C. Schweitzer[1], P. Veloso[1], A. P. Hoare[4], P. Gebicke-Haerter[2], M. Valdes[5], M. Hernandez[5,6]
[1]Universidad de Chile, [2]Faculty of Medicine, Universidad de Chile, [3]Faculty of Dentistry, Universidad Andrés Bello, [4]Laboratory of Oral Microbiology, Department of Pathology and Oral Medicine, Faculty of Dentistry, Universidad de Chile, [5]Laboratoy of Periodontal Biology, [6]Department of Pathology, Faculty of Dentistry, Universidad de Chile

Objectives To assess bacterial loads of *Porphyromonas sp*.and the modulation of the inflammatory response through Toll-like receptor (TLR)2 DNA methylation in symptomatic and asymptomatic apical lesions.
Methods Cross-sectional study. Apical lesions were obtained from volunteers with asymptomatic apical periodontitis (AAP) (n=17) and symptomatic apical periodontitis (SAP) (n=17) having indication of tooth extraction, and both total RNA and DNA were extracted. TLR2, IL-6, TNF-a, IL-10,and TGF-bmRNA levels were quantified by qPCR. DNA was bisulfited, amplified by qPCR using a previously validated primer for the CpG island on its promoter, and the products were sequenced. The results were analyzed by BiQanalyzer. Additionally, the bacterial DNA was extracted using lysis buffer containing lysozyme (AAP n= 29; SAP n=35) for *P. endodontalis*,*P. gingivalis*and total bacterial quantification by qPCR using validated primers.
Results The frequencies of detection of *P. endondotalis, P. gingivalis* and total bacteria were 6.9%, 13.8% and 65.5% in PAA and 37.1%, 22.9% and 72.2% in PAS, respectively; but differences were statistically significant only for detection of *P. endodontalis*($p<0.05$). SAP demonstrated a hypomethylated DNA profile at the TLR2 CpG island compared to AAP, along with up-regulated expression of TLR2 and pro-inflammatory cytokine IL-6; while TLR2 hypomethylation associated with IL-10 levels in SAP. ($p <0.05$). Specifically, lower methylation frequencies of CpG dinucleotides localized in -8, -10 (binding sites for NF-ϰB) and -142 (binding site for Sp1) from TLR2 promoter were identified in SAP versus AAP ($p<0.05$).
Conclusions TLR2-mediated inflammation can be epigenetically regulated in symptomatic apical lesions through DNA hypomethylation, favoring the binding of the main transcription factors responsible for the induction of TLR2 transcription inresponse to bacterial challenge

Psychosocial Factors and Dental Pain Experience in Endodontic Treatment.

M. A. Fernandez[1], C. Bernal[1], J. F. Oyarzo[2], R. Toloza[1], M. Casals[1]
[1]Universidad andres bello, [2]Universidad Andres Bello

Objectives Pain experience is explained under a biopsychosocial model, however dental pain has not yet been evaluated under this methodology. Objective: To explore psychosocial behaviors and chronic dental pain relations in patients which followed endodontic treatment.
Methods Method:140 patients (mean age 38,63; SD=14,28), male (44.6%) and female 55.4%), which pursued endodontic treatment were assesed. They were classified by pulpar pain (n=59), periapical pain (n=55) or no dental pain (eg. prosthetic indication; n=17). Pain was evaluated in VAS scale in 4 instances: baseline, baseline to sensitive-stimuli, 7 days after root seal and 14 days after obturation. Days with dental pain was recorded and headache history (yes or no) as a trigeminal comorbidity. Psychosocial questionnaires were assessed at baseline for anxiety (GAD-7), depression (PHQ-4), pain catastrophizing (PC), physical symptoms (PHQ-15), pain intensity and pain interference (GCPSv2) and Jaw functional limitation (JLFS-8). Data was first described and then analyzed throw Pearson`s correlation between pain variables and psychosocial factors (significant value of $p < 0.05$).
Results Results:Data showed GAD-7 (m=5.47;SD=4.96), PHQ-4 (m=2.36;SD=2.54), pain catastrophism (m=16.57;SD=13.04), PHQ-15 (m=6.58; SD=4.53), JLFS-8 (m=7.56;SD=8.87), pain intensity (m=28.91;SD=27.88), pain interference (m=13.77;SD=22.40) as psychosocial presence. Pain experience results were VAS baseline (m=1.23;SD=2.25), VAS sensitive-stimulus (m=4.67;SD=3.48), VAS control 1 (m=0.57;SD=1.50), days with dental pain (m=120.59;SD=357.61), headache presence (m=0.43;SD=0.49), chronic facial pain (m=0.64;SD=0.47).Pain intensity was positive correlated with GAD-7 (r=.251), PC (r=.462); JFLS-8 (r=.408), Pain interference was positive correlated with GAD-7 (r=.175), PC (r=.421), JFLS-8 (r=.558). Days with dental pain was positive correlated with GAD-7 (r=.192). Baseline Pain and Stimulated Pain was positive correlated with PC (r=.236; r=.255), JFLS-8 (r=.205; r=.270) and headache presence with GAD-7 (r=.328), PC (r=.286), JFLS-8 (r=.183), PHQ-4 (r= .338), PHQ-15 (r=.431).
Conclusions Conclusion: Pain intensity, pain interference and perception of dental pain are related with anxiety, depression and catastrophism. Jaw functional limitation can be also related to dental pain.

Cohesive Tensile Strength of Shortened Light-cured Bulk-Fill Composites

P. Pizarro[1], P. Atria[2], R. Hirata[3], C. Sampaio[2]
[1]Universidad de los Andes, [2]Universidad de Los Andes, [3]New York University

Objectives To evaluate cohesive strength (CS) of different bulk-fill resin composites, light-cured by two different light curing modes.
Methods Specimens were prepared for CTS test with three different bulk-fill composites: Tetric Evoceram Bulk-fill (TEC), Tetric Evoflow Bulk-fill (TEF), and an experimental Bulk-Fill composite (TEE) and light cured (Bluephase Style 20i) with either High curing mode for 10s (1200mw/cm2) or Turbo mode for 5s (2000 mw/cm2). The specimens were tested in a Shear Bond Tester machine until failure, immediately (24 hours) and after 5000 thermal cycles (TC). Values were recorded in MPa. Data were submitted to a normality distribution analysis, a two-way ANOVA and LSD post-hoc comparisons.
Results When the same resin composite was light cured by different curing modes, with or without TC, no statistical differences were observed ($p>0.05$). RCs used with the same curing mode, showed statistical decreased cohesive strength when TC was performed ($p\leq0.05$), however, when TEE resin composite was polymerized at high curing mode, the values were statistically similar both with and without TC ($p=0.181$). When different composites were compared within high curing mode with or without TC, no statistical differences were observed within them ($p>0.05$). For turbo curing mode, TEF presented higher cohesive strength than TEE ($p=0.012$) when no TC was performed, while similar results were observed compared to TEC ($p=0.100$). When TC was performed, no statistical differences were observed within composites ($p>0.05$).
Conclusions CTS from the bulk-Fill resin composites evaluates was not be affected by curing mode, although it was affected by thermocycling for all materials and curing modes, except for the experimental material in High mode.

Cognitive decline induced by *Porphyromonas gingivalis* is serotype-dependent

J. Díaz-Zúñiga[1], J. More[2], S. Melgar-Rodríguez[1], M. Jiménez[1], F. Villalobos[1], R. Vernal[3], A. Paula-Lima[2,4]
[1]Universidad de Chile, [2]Universidad de Chile, [3]Universidad de Chile, [4]Universidad de Chile

Objectives Periodontitis is the most prevalent bone resorptive disease, caused by a disbiotic subgingival microbiome formed by a wide variety of bacteria. Among these bacteria, *Porphyromonas gingivalis* has been associated with the onset and progression of periodontitis. Recently, this bacterium has been detected in *postmortem* brains of individuals diagnosed with Alzheimer's disease (AD). Thus, this study aimed to determine the hippocampal-dependent spatial memory in rats affected of periodontal periodontitis induced by different encapsulated serotypes of *P. gingivalis*
Methods Experimental periodontitis was induced in thirty male Sprague-Dawley rats by two palatal inoculations (days 1 and 7) of $1x10^{10}$CFU/mL containing different capsular serotypes of *P. gingivalis*. Sham-rats infected were used as controls. After 45 days of primary infection, OASIS Maze was performed to evaluate spatial memory and learning. Further, biological samples of palatal mucosa, maxillae, serum, cerebro-spinal fluid and hippocampus were taken for the quantification of inflammatory mediators and detection of AD histopathological hallmarks
Results Periodontitis-affected rats infected with K1 or K2 serotypes exhibited poor performance in the OASIS Maze task compared to sham rats and those infected with K4 or K- serotypes. Also an increase in the levels of inflammatory molecules were detected in serum, hippocampus and CSF from rats inoculated with serotype K1 or K2, in comparison to the other experimental conditions. Additionally, an increase in the level of extracellular $A\beta_{42}$, the oxidative stress marker, malondialdehyde and GFAP inmunoreactivity was observed in the hippocampus from rats inoculated with serotypes K1 or K2
Conclusions Periodontitis induced by the most pathogenic serotypes of *P. gingivalis*, K1 or K2, could cause hippocampal damage and memory loss and constitute a risk factor for the onset of AD.

Can *Porphyromonas gingivalis* migrate from periodontal tissues towards brain?

M. Jiménez Unión[1], F. Villalobos[1], J. Díaz-Zúñiga[1], J. More[2], S. Melgar-Rodríguez[1], R. Vernal[1], A. Paula-Lima[3]
[1]Universidad de Chile, [2]Universidad de Chile, [3]Universidad de Chile

Objectives *Porphyromonas gingivalis* is a Gram negative bacteria widely associated with aetiopathogenia of periodontitis, and the different *P. gingivalis* capsular serotypes have revealed distinct virulence potential. During periodontitis, *P. gingivalis* is detected locally in periodontal tissues and systemically in amniotic liquid, being associated with pre-term new-born. Recently, *P. gingivalis* has been also detected in IV ventricle brain in Alzheimer's disease individuals, suggestive of a potential role in its pathogenesis. Thus, this study aimed to determine the differential migratory capacity of *P. gingivalis* serotypes towards hippocampus and/or cerebrospinal fluid (CSF) in periodontitis-infected rats.
Methods Thirty male Sprague-Dawley rats were inoculated at days 1 and 7 with $1x10^{10}$CFU/mL of the different *P. gingivalis* serotypes. Sham-infected rats were used as controls. Samples of periodontal lesions, serum, CSF, and hippocampus were obtained and the *P. gingivalis* 16S rRNA detection was quantified by qPCR. In addition, the RgpA and Kgp DNA expression levels were determined by qPCR and the RgpA protein levels by flow cytometry.
Results Thirty male Sprague-Dawley rats were inoculated at days 1 and 7 with $1x10^{10}$CFU/mL of the different *P. gingivalis* serotypes. Sham-infected rats were used as controls. Samples of periodontal lesions, serum, CSF, and hippocampus were obtained and the *P. gingivalis* 16S rRNA detection was quantified by qPCR. In addition, the RgpA and Kgp DNA expression levels were determined by qPCR and the RgpA protein levels by flow cytometry .
Conclusions *P. gingivalis* is detectable in the peripheral blood circulation, hippocampus and CSF in periodontitis-infected rats independently of the inoculated *P. gingivalis* strain.

Regulatory T cell-derived extracellular vesicles modulate the Th1/Th17/Treg imbalance during periodontitis

C. I. Rojas Pérez[1,2], C. Terraza[1], E. A. Cafferata Chea[3], M. Campos-Mora[2], F. Galvez[2], M. E. Vega Reyes[1], K. Pino-Lagos[2], R. Vernal[4]

[1]Universidad de Chile, [2]Universidad de los Andes, [3]Universidad de Chile, [4]Universidad de Chile

Objectives The inflammatory nature of periodontitis triggered by polymicrobial dysbiosis sets a deregulated immune response within periodontal tissues. The local formation of a leucocyte-rich inflammatory infiltrate and accumulation of bone pro-resorptive factors result in destruction of tooth-supporting alveolar bone. This process largely relies on Th1 and Th17 lymphocytes, promoting inflammation and alveolar bone loss. Conversely, T regulatory lymphocytes (Tregs) dampen periodontal damage through immuno-suppressive mechanisms and tissue repairing functions. Recently, secretion of Tregs-derived extracellular vesicles (TEVs) has been identified as an immunosuppressive mechanism from which genetic material, cytoplasmic components, and/or surface molecules transfer and modulate target cells. Novel approaches indicate that immunomodulation may be achieved in a cell-free manner; hence, TEVs could represent an advantageous strategy to facilitate immunotolerance. Therefore, this study aimed to evaluate the immunomodulatory role of TEVs in the Th1/Th17/Treg imbalance responsible of alveolar bone resorption during periodontitis.

Methods From C57BL/6 mice, TEVs were isolated by serial centrifugation of culture supernatants obtained from induced $CD4^+CD25^+Foxp3^+$ Tregs. TEVs were characterized by nanoparticle tracking analysis and scanning electron microscopy. TEVs immunosuppressive function was evaluated both in vitro, by analyzing the proliferation and differentiation of $CD4^+$ T cells, and in vivo, by assessing the $CD4^+$ T-cell infiltration into periodontal lesions and cervical lymph nodes, as well as the alveolar bone loss, in a ligature-induced murine model of periodontitis.

Results TEVs displayed canonical characteristics of EV and 50-200 nm average size. TEVs reduced the T-cell proliferation, downregulated the IFN-γ (Th1) expression, and upregulated the Foxp3 expression (Treg-associated transcription factor master-switch gene). In addition, TEVs decreased the alveolar bone resorption and Th1/Th17 tissue infiltration in TEVs-treated compared with sham-treated periodontitis mice.

Conclusions TEVs reduced alveolar bone loss during periodontitis which can be explained by their capacity of modulate the Th1/Th17/Treg balance in terms of T-cell proliferation and periodontitis-affected tissue infiltration.

In-vitro differential endothelial response at repeated exposure of *Porphyromonas gingivalis*

S. M. Viafara Garcia, S. J. Morantes, Y. H. Chacon, D. M. Castillo, G. I. Lafaurie Villamil, D. Buitrago Ramirez

El Bosque University

Objectives The purpose of this study was to compare the chemokine production of HCAEC stimulated with single and repeated exposure of live *Porphyromonas gingivalis* or its lipopolysaccharide.

Methods Human Coronary Artery Endothelial Cells (HCAEC) were stimulated with 1 μg/ml of purified *Porphyromonas gingivalis*-LPS W83 or live-*P. gingivalis* at single or repeated doses up to 24 h. HCAECs were multiple challenges to LPS or live bacteria, thus the monolayer was stimulated for 6 h, after that, the stimulus was removed and then replaced with the next stimulus for another 6 h and finally for the last stimulation HCAEC were exposed to another 12 h. The supernatant between each exposure were collected for a total exposure time of 24 h and storage for soluble factors measuring, whilst for the second approach, the conventional stimulus was HCAECs stimulated with LPS or live bacteria at a single exposure for 1 day. Chemokine production and mRNA levels of IL-8 and MCP-1 were determined by flow cytometry and RT-qPCR respectively. A p-value <0.05 was considered statistically significant.

Results Only repeated exposure of viable-*P. gingivalis* induced significant production MCP-1 ($p<0.05$) and a slight increase of IL-8 in HCAEC supernatants, whilst for monolayer challenged with *P. gingivalis*-LPS, none of both approaches affected the chemokine identification compared with control. Similar results were observed with the mRNA level.

Conclusions The differential endothelial response is dependent on repeated exposure of viable *P. gingivalis*. This study supports the importance of more than one in-vitro exposure (repeated) of periodontopathogens which could lead to a better understanding of the endothelial dysfunction or pro-inflammatory activation.

Nucleic acid-free extraction protocol development for characterization of *Porphyromonas* Lipopolysaccharide

P. Veloso[1], M. Hernandez[1], A. Escobar[2], A. P. Hoare[3]
[1]Universidad de Chile, [2]Universidad de Chile, [3]Universityersidad de Chile

Objectives The lypopolisaccharide (LPS) of *Porphyromonas gingivalis* (*Pg*) and *P. endodontalis* (*Pe*) are related to the etiopathogenesis of apical periodontitis. However, only the LPS structure of *Pg* has been characterized, while it remains unknown for *Pe*. During LPS purification, elimination of possible traces of proteins and nucleic acids still represents a main challenge. We aimed to purify LPS from *Pg* and *Pe* reference strains and their endodontic clinical isolates collected from patients with apical periodontitis.
Methods First, TRIzol extraction protocol (Yi and Hackett) was used from *Pg* and *Pe* cultures. After analysing the obtained LPS, a stage of sonication of the pellet and incubation with DNase and RNAse was incorporated prior to the extraction protocol to eliminate contaminating nucleic acids. Subsequently, the LPS were visualized in polyacrylamide gels (SDS-PAGE) stained with silver. Proteins were quantified by Bradford and nucleic acids were visualized in agarose gels stained with GelRed
Results LPS were obtained from all strains of *Pg* and *Pe*. After classic TRIzol extraction protocol, contamination with proteins was ruled out in all samples, although a nucleic acid band less than 100 base pairs persisted. The incorporation of a sonication stage to lyse the cells in addition to the DNase and RNase treatment, removed the contaminants. The performance fluctuated between 1-8 mg.
The LPS obtained from *Pg* presented the characteristic electrophoretic profile of the species, with a preferential length of O antigen (Oag) of more than 8 repeated units. On the other hand, the LPS from *Pe* -which has not been previously characterized- presented a region of A-core lipid practically absent, being mainly replaced by OAg molecules of 8 to 14 repeated units.
Conclusions Therefore, we managed to develop a pollutant-free LPS extraction protocol, suitable for assessing its immunogenic activity, in addition to visualizing the *Pe* LPS, previously not described.

Histopathological findings in peri-implant tissue from patients with peri-implantitis.

B. Venegas[1], W. Donoso[2], C. Ulloa[3], I. Valdivia[4], V. Beltrán[5]
[1]University of Talca / Carlos Van Hospital, [2]University of Talca, [3]University of Concepcion, [4]University of Antofagasta, [5]University of La Frontera

Objectives To determine the structural histological characteristics of peri-implant tissue in explanted samples from patients with dental implants with osseointegration failure. It is also proposed to analyze a probable association with clinical variables.
Methods Fourteen peri-implant tissue samples were processed by conventional histological technique, stained with Hematoxylin and Eosin, histochemical and immunohistochemical stains. Microvascular Density, inflammatory infiltrate, connective tissue and AgNORs were qualitatively analyzed using a Leica DM 500 microscope and Leica ICC50 W camera and software Image J 1.52.The study is carried out in the context of the research project "Immunohistochemical, histochemical and endoscopic analysis of bone tissue associated with periimplantitis: Development of an In vivo and In vitro model", awarded in the Conicyt competition to support the formation of international networks for researchers in initial stage 2017, whose code is “REDI170658”. Ethics approval by University of La Frontera, Chile.
Results Variable amounts of blood vessels and inflammatory infiltrate were found in soft periimplant tissues, evidencing presence of periimplant mucositis. Inflammatory cells were mainly lymphocytes and plasma cells, which means presence of a chronical stage of inflammation. No foreign body reaction was found and scarce amount of osteoclasts were observed in periimplant bone tissue. Mainly collagen type one was found in connective tissue, which is interpreted as a normal process of healing associated to inflammation. Number of AgNORs were observed in increased number in epithelial cells near inflammatory process. No association to clinical variables could be observed.
Conclusions Histopathological findings observes in periimplant soft and bone tissue are according with a common chronical inflammatory process. Possible associations with clinical characteristics require further analysis.

ORAL COMPLICATIONS OF TRANSPLANTED PATIENT

R. Valenzuela
Regional Hospital of Antofagasta

Objectives To assess the prevalence of oral mucosa lesions and analyze possible oral complication associations whit drugs use and relevant clinical variables, in a group of transplant patients of Second Region of Chile.
Methods 35 kidney transplant patients and 12 liver transplants were examined, carried out between 2002 and 2015. Independent of the date of the transplant surgery, a 24 month follow up was performed. Patients are classified according to immunosuppressive treatment, date of trasplant, sociodemographic characteristics and general oral health status. All patients were performed a clinical dental and radiographic examination. In patients with mucogingival alterations, diagnostic confirmation was performed with excisional biopsy and immunohistochemistry. A logistic regression model was used to analyze the association between gingival hyperplasia, drug use, date of transplant and dose. Every patient signed an informed consent.
Results The most prevalent findings were gingival hyperplasias in patients treated with cyclosporin A, reaching 10%, and 5% of patients treated with tacrolimus. one case of squamous cell carcinoma of the gum with invasive micro focus, possibly due to long-standing cyclosporine, a finding about gingival hyperplasia. There were 2 patients with necrotizing periodontitis. One of them, days after oral diagnosis was hospitalized for infection of the digestive tract. It should be noted that more than 70% of patients have an oral hygiene index below 80%. 25% of patients have some type of periodontitis. Logistic regression results showed an association between gingival hyperplasia with long-standing treatment of the immunosuppressive drug ($P<0.05$), but not with the type of drug or type of transplant.
Conclusions It is important the periodic dental control of transplanted patients, to adapt proper oral hygiene techniques even during their hospitalization stays. Educate patients and the medical team about the possible consequences, not only systemic, but also oral, that entails immunosuppression after transplantation, thus diagnosing any complications in a timely manner.

Poster Session

Clinical symptoms lesion size and smoking statuts in apical periodontitis

B. Marín[1], A. González[1], A. Fernández[1,2], M. Hernandez[1]
[1]Universidad de Chile, [2]Universidad Andres Bello

Objectives To assess whether the presence of clinical symptoms and lesion size were associated with smoking status in apical periodontitis individuals.
Methods Cross-sectional study. Patients with diagnosis of apical periodontitis (AP) and at least one apical lesion consulting at the clinic of surgery in the Faculty of Dentistry Universidad de Chile, and Public Assistance Hospital (HUAP), Santiago, Chile were included. Exclusion criteria were co-existence of any systemic disease or NSAIDs or antibiotics consumption of in the last 3 months. Patients were examined; demographic, clinical and radiographic data, and current smoking status were registered on clinical records. The results were analyzed with Chi squared or Mann-Whitney test in STATA® V12 program.
Results A total of 50 non-smokers and 34 smokers were included. The demographic variables age, sex and socioeconomic level were similarly distributed among the groups ($p>0.05$). 50% of smokers presented either symptomatic or asymptomatic AP. Larger apical lesions were found in non-smokers, but differences were not statistically significant ($p<0.05$).
Conclusions No evident association was found between clinical symptoms, lesion size and smoking status in apical periodontitis.

Periodontal Status and Creatinine Correlation in Chronic Kidney Disease Patients

M. Souyet[1], D. Menares[1], A. Ortiz[2], D. Albers[3], P. Smith[1]
[1]Pontificia Universidad Católica de Chile, [2]Facultad de Medicina, Pontificia Universidad Católica de Chile, [3]Facultad de Odontología, Universidad Mayor

Objectives The association between periodontal and systemic diseases has been proposed by several studies. Although different studies have analysed the possible interaction between periodontitis and chronic kidney disease (CKD), the precise connection between these two diseases remains unknown. The aim of this study was to evaluate the possible correlation between the severity of periodontitis and plasmatic creatinine levels in a Chilean population of CKD patients' candidate to kidney transplantation.
Methods Two calibrated operators evaluated 17 patients with CKD candidate to kidney transplant. Full periodontal examination comprised probing depth (PD), clinical attachment level (CAL), bleeding on probing (BOP) and plaque index (PI) determined in 6 sites per tooth. Plasmatic creatinine levels were evaluated for all patients. Spearman Correlation to analyse if there exists correspondence between periodontal parameters and plasmatic creatinine levels was done.
Results Six female (35%) and 11 male patients (65%), whose ages ranged from 23 to 66 (46,2) were included. The average number of remaining teeth was 24,2. The Spearman Correlation Analysis showed no correlation between PD, CAL, BOP or PI and plasmatic creatinine levels.
Conclusions No correlation was found between periodontitis and plasmatic creatinine levels in this population. The present results represent the partial outcome of an ongoing clinical study. Therefore, it is imperative to increase the number of subjects analysed before generating a final conclusion regarding the interaction between periodontitis and CKD.

Effect of toothpastes with nano-sized calcium glycerophosphate on enamel demineralization

N. G. Emerenciano[1], A. C. Delbem[2], J. P. Pessan[3], F. Gonçalves[4], E. Camargo[6], M. d. Silva[1], M. Danelon[5]
[1]UNESP, [2]UNESP, [3]UNESP - São Paulo State University, [4]School of Dentistry - São Paulo State University (UNESP), [5]São Paulo State University, [6]UFSCar

Objectives The aim of this study was to evaluate *in vitro* the anticariogenic potential of conventional toothpaste supplemented with microparticles and nano-sizeds of β-Calciun Glycerophosphate (β-CaGPm/β-CaGPn).
Methods Bovine enamel blocks (4 mm x 4 mm, n = 120; 12/group) were selected through the initial surface hardness (SHi) and then divided into 10 groups of experimental toothpastes: Toothpaste without fluoride/β-CaGPm/β-CaGPn (Placebo); Toothpaste with 1100 ppm F (1100F); Toothpastes with 1100 ppm F associated with concentrations of 0.125%; 0.25%; 0.5% and 1.0% of β-CaGPm and β-CaGPn, which were subjected to pH cycling for five days. The treatment was performed daily with 2mL of toothpaste slurry, 2x/day. Next, the final surface hardness (SHf) was determined for the calculation of surface hardness loss (% SH) and integrated surface hardness loss (ΔKHN). Data were submitted to analysis of variance (ANOVA-one-way) followed by Student-Newman-Keuls test ($p < 0.001$).
Results Toothpastes containing 1100F associated with 0.5% β-CaGPm and 0.25% β-CaGPn had lower SH% values than the conventional toothpaste (1100F) ($p < 0.001$). The ΔKHN for 1100F associated with 0.25% β-CaGPn was ~ 43% and ~ 10% lower when compared to 1100F and 1100F associated with 0.5% β-CaGPm, respectively ($p < 0.001$).
Conclusions It is concluded that the supplementation of toothpaste with 0.25% β-CaGPn produced a greater protective effect in the inhibition of the enamel demineralization when compared to the conventional toothpaste (1100 ppm F).

Morphological Characteristics of the Craniofacial Growth and Development Phenotypes

V. Risso, D. Becerra, D. Vicuña
Universidad de los Andes

Objectives Vertical mandibular growth shows large morphological variations during its development as it matures late. Is important to study these variations since hyperdivergent patients are clinically difficult to manage, exhibiting aesthetic and functional problems. The aim of this study was to describe morphological characteristics of hypo (A), normo (N) and hyperdivergent (H) phenotypes.
Methods 316 teleradiographs were measured cephalometrically. 27 variables were measured, including (and discussed) height of the mandibular ramus (HMR), goniac angle (GA), upper and lower lip protrusion, and chin projection. Continuous variables were measured with central tendency and dispersion measures. The relationship between variables with the phenotypes was measured with an ANOVA test. All statistical analyzes were performed using Stata 5.0. This study was approved by the scientific and ethical board of Universidad de los Andes, Chile.
Results Significant differences were observed between the groups for the HMR (AH: $p = 0.00$; NH: $p = 0.03$) where the hyperdivergent was significantly lower, the GA (AH: $p = 0.00$; NH: $p = 0.00$) where the hyperdivergent was significantly higher, upper lip protrusion (N H: p= 0,035), lower lip protrusion (AH: p= 0,041; N – H: p= 0,01), where hyperdivergent were lower and chin projection (AN: $p = 0.03$; AH: $p = 0.00$), where hypodivergent were higher than other groups.
Conclusions Mandibular growth includes physiological processes that involve movement and displacement of bone structures and soft tissues. The mandibular ramus is one of the main places of vertical mandibular growth. If a clockwise mandibular rotation occurs, it prevents vertical growth of the ramus and generates an increase anterior facial hiegth. The anterior rotation is fundamental for the projection of the chin, as we see in our study. In conclusion there are characteristics of posterior rotational growth in the hyperdivergent phenotype, that have consequence at sagittal level of soft tissues.

A retrospective Analysis of Panfacial Fractures and Polytrauma: Case Series

M. Bravo
Hospital Clínico Mutual de Seguridad

Objectives Panfacial fractures (PFFs) are commonly defined as those that simultaneously involve the three transverse thirds of the facial region, as a result of high-energy trauma. The purpose of this study was to analyze the epidemiological features of polytrauma patients (PTP) treated for PFFs in the Mutual de Seguridad Clinical Hospital (MSCH).
Methods This retrospective observational study was conducted on cases at the MSCH, where the data of patients treated by the Maxillofacial Surgery unit between January 2016 and December 2018 were reviewed. The inclusion criteria was: patient with simultaneous fractures of at least 3 of 4 axial segments of the facial skeleton and diagnosis of polytrauma. Exclusion criteria: insufficient data or not available. 785 files were reviewed, of which 5 were included according to criteria.
Results The 5 patients had a total of 55 types of fractures (table 1). The most predominant etiology was car accident (60%). The patients were aged between 21 and 57 years with mean age of 45 years. There was only one female patient. All patients had associated other injuries, multiple complications and sequelae (table 2). 80% of the patients underwent reintervention for internal fixation removal (table 3). The time between the accident and the last surgical procedure varies between 8-36 months, while the follow-up time varies between 10-49 months.
Conclusions The PFFs have a complex nature even for the most experienced surgeons, especially in polytraumatized patients. Among the many possible complications, the most prevalent was wound sepsis. As for sequels, they were aesthetic, dental, neuropathic or ocular problems. In order to reduce the rate of complications, reinterventions and sequelae, it is recommended to resolve the PFFs early, with a multidisciplinary medical team, with emphasis on antiseptic surgical procedures.

EFFECTS OF NON-INVASIVE THERAPIES IN TMJ WITH DEGENERATIVE DISEASES.

C. Prieto[1], M. Casals[2], C. Marholz[2], C. Valdes[3], G. Moncada[1]
[1]Universidad de Los Andes, [2]Universidad Andres Bello, [3]Universidad de Los Andes

Objectives The objective of the study was to evaluate the clinical performance of non-invasive therapies applied to patients with degenerative bone disorders of the TMJ.
Methods Method: 25 patients (X=32.2 years, Women 72%) with degenerative bone disorders of the TMJ, diagnosed by an expert clinician (K=0.81) according to RDC-TMD criteria and backed by computed tomography (CT) and magnetic resonance imaging (MRI) (n=50 ATM) according to Ahmad criteria (calibrated operator K=0.92). The clinical and imaging evaluation was carried out in two stages; A: Before treatment and B: One year after treatment. The therapeutic objectives were pain control, return of normal functional ranges, limitation of the degenerative process and control the progression of disc displacement. The therapeutic scheme applied consisted of: education and change of habits, orthopedics of distraction and stabilization, physical therapy, pharmacotherapy and nutritional supplements. The normality and homogeneity of the data (Levene/Kolomogovov Smirnov) was determined, statistical analysis of Pain (Pa), Condylar Erosion (CE), Effusion (E), Pseudocyst(PC), Closed Mouth Disc Displacement (CMDD), Open Mouth Disc Displacement (OMDD), was performed with the McNemar's test and Pearson's correlation CI=0.95%(SPSSv15.0).
Results Results: From stages A and B: expressed in average value, correlation and P, separated by parameter: Pa: A:VAS=4.18 (n =48); B:VAS=0.17 (n =2), (r=0.149, p=0.0001). CE: A: n=29, B: n=17 (r= 0.012, p=0.012). E: A: n=32; B: n=2 (r=0.131, p=0.109). PC: A: n=7, B: n=5 (r=0.01, p=0.688). CMDD A: n=48; B: n=35 (r=0.447, p=0.691). OMDD: A n=26; B n=48 (r=0.194, p=0.001). All data were non parametric. Mean age X=32.2 years (±11.58), Female Sex 72% (n=18).
Conclusions Conclusions: The non-invasive therapy of patients with degenerative bone alterations of the TMJ showed a significant reduction in painful symptoms, and partial modification of imaging signs at one year of control.

Histologic assessment of resinous endodontic sealers containing calcium hydroxide.

J. Q. Trizzi[2], C. Bueno[1], M. T. Cury[2], A. V. Vasques[2], J. L. Sarmiento[1], L. C. Silva[1], D. M. Tavares[1], E. D. Junior[1]
[1]UNESP, [2]Univ Estadual Paulista

Objectives The aim of this study was to evaluate, *in vivo*, the biocompatibility and mineralization ability of resin epoxy-based endodontic sealers in subcutaneous tissue of rats, implanted with polyethylene tubes filled with Dia Pro Seal, Sealer Plus and Sealer 26.
Methods Twenty Wistar rats were assigned and received the test groups and a control with empty tube (n= 10 animals/group). After 7 and 30 days the animals were euthanized and the polyethylene tubes removed with the surrounding tissues. Inflammatory infiltrate and thickness of fibrous capsule were histologically evaluated. Mineralization was assessed via Von Kossa staining and under polarized light.
Results Data were tabulated and analyzed by Kruskal-Wallis and Dunn's test ($p<0.05$). All the groups induced moderate inflammatory reaction in the initial period with a thick fibrous capsule. In the 30-day period, all groups induced milder inflammatory reactions, and a thinner fibrous capsule, with no statistical difference ($p>0.05$). Von Kossa staining and birefringent structures were positive only for Sealer 26 in both periods, whereas Dia Pro Seal and Sealer Plus exhibited no signs of biomineralization, similar to control.
Conclusions Under the conditions of this experiment, all tested sealers were biocompatible, but only Sealer 26 induced biomineralization.

Localization of Interleukin-6 Signaling Complex in Epithelialized Apical Lesions

C. Schweitzer[1], M. Garrido[2], R. Paredes[5], A. Fernández[1,3], M. Hernández[1,4]
[1]Universidad de Chile, [2]Universidad de Chile, [3]Universidad Andrés Bello, [4]Universidad de Chile, [5]Universidad Andrés Bello

Objectives IL-6 signaling complex is key in the development of apical lesions, though its localization and role in epithelialized lesions is unknown.
The objective is to determine the immunolocalization of the interleukin (IL)-6 signaling complex in epithelialized and non- epithelialized apical lesions of endodontic origin (ALEOs).
Methods Epithelialized (n = 8) and non-epithelialized (n = 7) ALEOs were obtained from teeth with indication of extraction. All tissues were subjected to routine processing for histopathologic examination, immunohistochemistry and double immunofluorescence to determine the tissue localization of IL-6, IL-6 receptor (R) and glycoprotein (gp)-130.
Results IL-6, IL-6R and gp-130 were immunolocalized in endothelial cells and mononuclear leukocytes within the connective tissue of epithelialized and non-epithelialized ALEOs. In the epithelialized lesions, the IL-6 signaling complex was also identified to the proliferating immature epithelium in a diffuse pattern; and in the basal and suprabasal layers of mature lining epithelium. In this later epithelium type, IL-6R was markedly distributed in a cell membrane pattern.
Conclusions IL-6 complex was ubiquitously identified in epithelialized ALEOs. IL-6R was consistently localized to epithelial cells in two different patterns: diffuse for proliferating immature epithelium and cell membrane for mature lining epithelium.

Comparison Between Novel Caries Removal Methods and Adhesion to Dentin

E. Caceres[1,2], F. Melo[1], S. P. Baez[1], L. Araya[1], G. Zelada[1], M. Gajardo[1]
[1]Universidad Andrés Bello, [2]New York University

Objectives The purpose of this study is to compare Polybur P1 burs and gel Brix 3000 to conventional caries removal method using carbide burs and to study the tensile bond strength to remaining dentin after being restored with composite resin.
Methods 45 permanent premolars and/or molars with clinically cavitated dentin caries were selected. Teeth were randomly distributed in three groups for caries removal using carbide burs, Polybur P1 burs and chemomecanical method using Brix 3000. After removal, samples were divided in half, obtaining a portion for histologic analysis and another for restoration and evaluation of tensile bond strength.
Results Statistical analysis showed significant differences between the method used and the presence of caries after removal, however, there were no differences when comparing the method used and the presence of affected and infected dentin. Regarding the tensile strength variable, there were significant differences between samples treated with carbide and Brix 3000, the latter being which showed the lowest bonding strength values. Regarding the interaction between the variables "removal method", "substrate obtained after removal" and "tensile strength", there were no statistically significant differences.
Conclusions Of the studied methods, Polybur P1 and Brix 3000 show the highest amount of remaining carious dentin, suggesting they are more conservative removal methods. Nevertheless, when comparing adhesive bond strength after using Brix 3000 and carbide, the best results are obtained with carbide burs.

"PULL-OUT BOND STRENGTH OF ANATOMIC RESIN FIBER POST VERSUS FIBER POST"

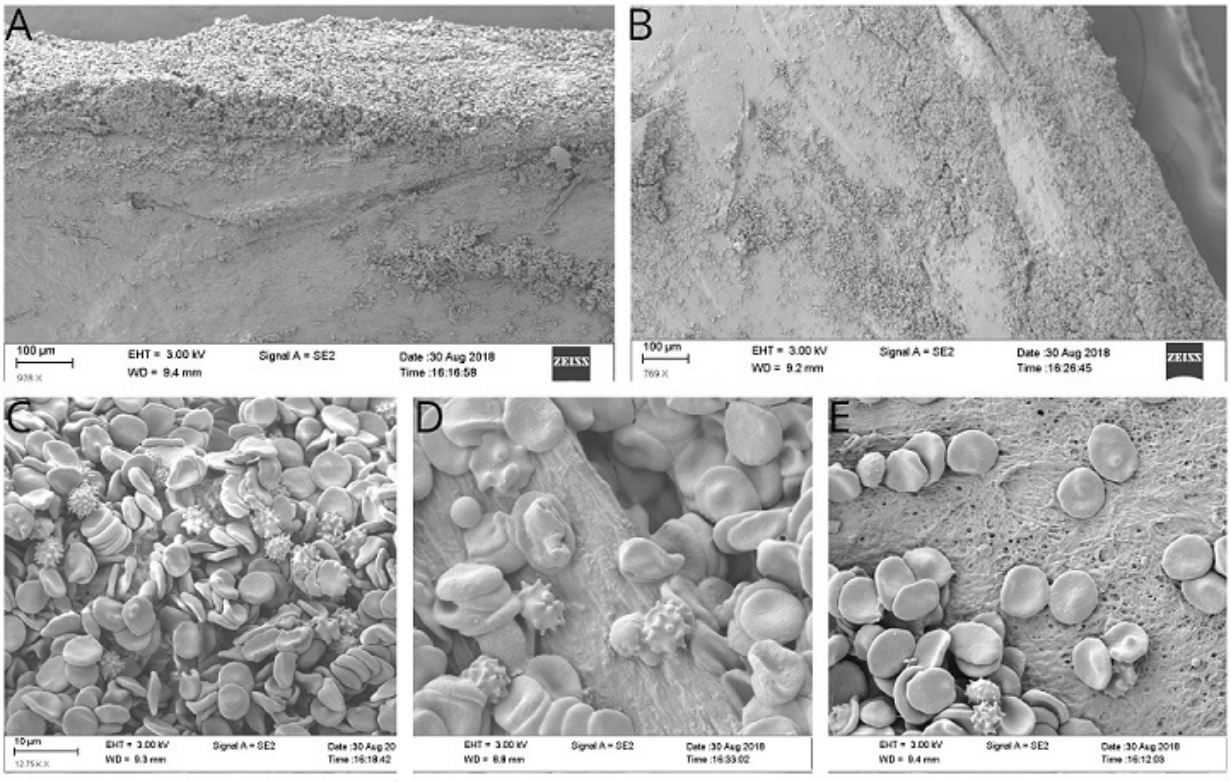
c. a. morales, c. Cayupan, K. Hillmer, A. Hidalgo, S. Morales, T. Urrea
Universidad Nacional Andres Bello

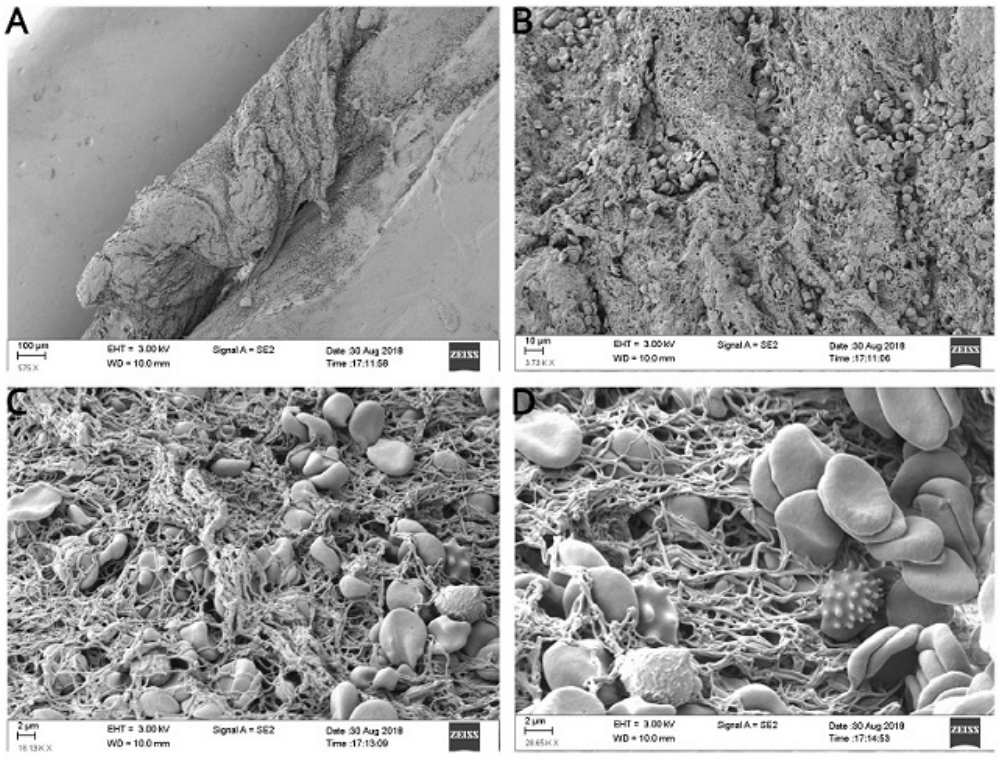
Objectives Evaluate the values of pull-out bond strength of anatomic fiber post with composite Filtek Z350 XT, in premolars treated endodontically with flared roots
Methods 70 human unirradicular premolars, coronal sectioned and endodontically treated were divided into 2 groups randomly. Each group was made up of 35 unirradiculated, treated, desobturated and canals were flared to receive: Group A (control) fiber post and Group B, an anatomized post with composite Filtek Z350 XT (3M ESPE). The post preparation was with Silane (Prosil) and Universal Single Bond adhesive (3M ESPE). A RelyX Fiber Post size 2 (3M ESPE) was used in both samples. In both groups, RelyX U200 AutoMix (3M ESPE) was used according to the manufacturer's instructions and with the Elipar DeepCure-L LED lamp (3M ESPE) previously calibrated at 1200 mW / cm2. The samples were subjected to a 500 cycle thermocycling process and tested on a Zwick / roell z100 universal traction machine. Pull-out resistance and type of failure were evaluated by 4x optical microscopy. The results were statistically analyzed using the shapiro wilck test and the student t test, with a significance level of 95%.
Results The mean and standard deviation in megapascals (Mpa) for group A was 6.85 (+/- 2.06) and for group B, 7.40 (+/- 2.25). Failure mode distribution for group A was 57% adhesive and 43% mixed, for Group B was 31% adhesive, 54% cohesive and 15% mixed. There was not significant difference in the strength bond between the groups ($p>0.05$).
Conclusions There are no statistically significant differences in the pull-out adhesive resistance in conventional and anatomical posts in unirradiculated premolars with flared roots.

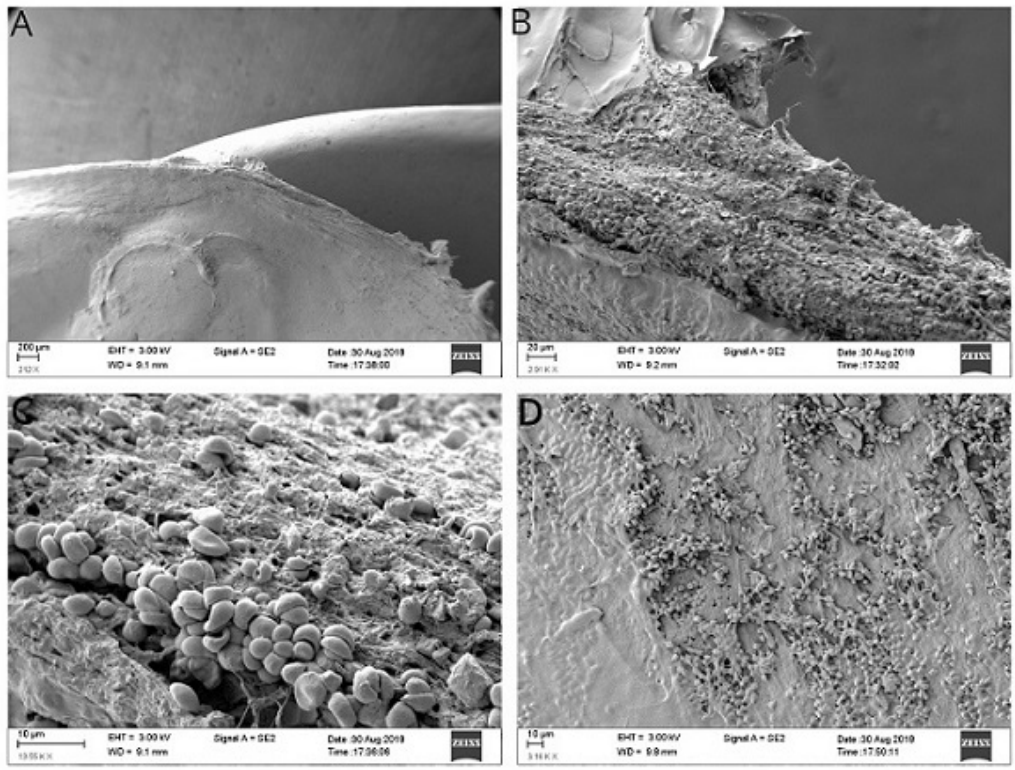
3D Structural Variation of L-PRF Under Different Centrifugation Protoclols

F. I. Cristi[2], A. N. Martinez[2], P. Aravena Torres[2,1], J. E. Kunstmann[1,2]
[1]Universidad Austral de Chile, [2]Universidad Austral de Chile

Objectives To describe and compare the fibrin network architecture, presence and morphology of the leukocytes in the L-PRF under three different centrigutaion protocols.
Methods Twelve blood samples were collected from 6 voluntary dentistry students between 20 and 25 years old, with no medical history, recent aspirin intake or any condition that affects the coagulation process. This was approved by the ethics committee of the Universidad Austral de Chile in June 8th 2018. These samples were separated equally into three groups: (1) 200G x 12 minutes, (2) 400G x 12 minutes and (3) 600g x 12 minutes (3). From each group, two samples were immersed in 10% formaldehyde for the optical microscope, stained with Masson and Giemsa stains respectively. The other two in 2.5% glutaraldehyde for scanning electron microscopy.
Results Under the optical microscope, the distribution and cellular architecture of the leukocytes were observed and compared among groups, and the density of the fibrin matrix partially, with leukocytes present in all groups, but the distribuiton and quantity in each group was slightly different, being group (2) the most homogeneous. In the scanning microscope analysis the results shown in the optical microscope were confirmed, and also analyling the quality of the fibrin matrix and morhpological evaluation of cells.The fibrin matrix was dense in all groups, with leukocyte presence, but group (2) was the one with the best quality, quantity and distribution overall.
Conclusions We can conclude that the 400g x 12 minutes protocol, with the centrifugue we used, shows the best results overall compared with the other two groups, but we must consider that our evaluation was only visual, with one centrifugue brand. To further research the L-PRF quality and ideal protocol, both visual and growth factor measurement should be done, with the same centrifugue and different preparation protocols.




A
B
C
D
100 µm
EHT = 3.00 kV
WD = 10.0 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:11:58
ZEISS
10 µm
EHT = 3.00 kV
WD = 10.0 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:11:06
ZEISS
2 µm
EHT = 3.00 kV
WD = 10.0 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:13:09
ZEISS
2 µm
EHT = 3.00 kV
WD = 10.0 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:14:53
ZEISS


A
B
C
D
200 µm
EHT = 3.00 kV
WD = 9.1 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:38:00
ZEISS
20 µm
EHT = 3.00 kV
WD = 9.2 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:32:02
ZEISS
10 µm
EHT = 3.00 kV
WD = 9.1 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:36:06
ZEISS
10 µm
EHT = 3.00 kV
WD = 9.8 mm
Signal A = SE2
Date :30 Aug 2019
Time :17:50:11
ZEISS

Prevalence of posterior crossbite in the Barros Luco Healthcare Complex

J. P. Scheu[1], F. Zafe[3], F. P. Keith Álvarez[2]
[1]-, [2]Universidad San Sebastian, [3]Universidad Mayor

Objectives The objective of the study was to study the epidemiology of cases of crossbites in patients treated at the Barros Luco Healthcare Complex.
Methods It has been made an observational epidemiological study, were was analyzed the data from the anonymous database of patients in treatment during the present year, in the specialty of Orthodontist of the Dental Specialties Service of the Barros Luco Healthcare Complex.
Results Of the total of 250 patient, 190 was registered with no alteration, 43 registered unilateral posterior crossbite and 17 registered bilateral crossbite.
Conclusions The cross bites correspond to a malocclusion in the transverse plane of the maxilla, defined as the alteration in the correct articulation of the palatal cusps of the molars and upper premolars with the molars and lower premolars.
Dentomaxillary Abnormalities correspond to the third most prevalent oral pathology in the Chilean population, after dental caries and periodontal diseases.
The professional practice usually generates a number of queries related to cranio faciodental development and especially with the transverse growth that dental arches possess, resulting in the presence of posterior cross bite. An early diagnosis is essential for orthopedic treatment to perform the correction of crossbites at an early age, in mixed dentition 1st Phase, since with our devices we will perform an orthopedic treatment of opening the middle palatal suture and correct skeletal transverse problems.

Masticatory Loads and the Shape of the Mandible Condyle Head

C. Morales, I. Vargas, V. Toro - Ibacahe
Universidad de Chile

Objectives To evaluate the shape of the left condyle head (CH) of groups that differ in the magnitude and direction of masticatory loads: Intense, Medium, Low, Altered-skeletal class II (CII) and Altered-skeletal class III (CIII) in order to discuss their possible links to TMJ disorders.
Methods CT-based 3D reconstructions of the CHs of 56 individuals were used. 116 landmarks and semilandmarks were placed on the surface of each CH. Geometric morphometric tools were used to descriptively analyze and visualize shape variation among groups.
Results Principal components analysis showed that the low masticatory load group shows the most within-group shape variation. The Intense and Medium groups show more constrained variation. CII tends to show more particular features: their CH is vertically and mediolaterally more extended, with the highest point closer to the medial pole, and a different orientation of the main axis. CIII on the other hand, does not remarkable differences.
Conclusions Modern humans show a wide variation of the CH shape; this could be explained by the low stimulation of the condyle head due to low masticatory loads; within modern humans, CII individuals show a more particular morphology. This morphology needs to be further studied to assess for detailed functional/pathological consequences that may explain the relatively higher prevalence of CII individuals to suffer from TMJ disorders.

Patient Experience With Non-Surgical Periodontal Therapy: A Qualitative Study.

M. A. Ortega Lizana, D. Prieto, P. Vásquez, F. Cáceres, C. Melendez
Universidad de los Andes

Objectives Explore the experiences of patients treated through non-surgical periodontal therapy in the periodontic specialization program of the Universidad de los Andes from a phenomenological qualitative approach.
Methods Fifty patients at the San Bernardo Health Center in Chile were recruited by telephone call, of which 17 individuals agreed to participate and 15 informants came and signed the informed consent. The experiences were gathered through in-depth interviews to recognize the impact on their quality of life and their satisfaction. The interviews were recorded, transcribed verbatim and analyzed by 3 researchers who codified the answers into categories to establish the emerging topics.
Results The core categories that emerged from the speeches of the participants were the reason for consultation; discovery of the condition; explanation of the treatment; deal with the professional; consequences of not having been treated; experience during the treatment; post-treatment consequences; given indications; and satisfaction.
Conclusions There is little knowledge of periodontal disease, the cause of consultation was bleeding, mobility and aesthetics, the treatment generates pain, fear and was invasive and dentine hypersensitivity occurs. However, patients would be willing to do it again and are satisfied with the care and treatment received. More studies are required to better understand the current situation of patients. It is recommended to propose improvements in the teaching on periodontitis, the care to be performed and a rigor in the follow-up and communication at the San Bernardo Health Center.

Table 1. Demographic characteristics

Case	Gender	Age (years)	Diagnosis
1	M	41	Aggressive Periodontitis
2	F	58	Chronic Periodontitis
3	M	51	Chronic Periodontitis
4	M	78	Chronic Periodontitis
5	F	42	Aggressive Periodontitis
6	F	62	Chronic Periodontitis
7	F	58	Chronic Periodontitis
8	F	51	Aggressive Periodontitis
9	M	67	Chronic Periodontitis
10	M	32	Aggressive Periodontitis
11	F	64	Chronic Periodontitis
12	F	41	Chronic Periodontitis
13	M	68	Chronic Periodontitis
14	F	47	Chronic Periodontitis
15	M	37	Aggressive Periodontitis

M: Male F: Female

Table 2: Summary of categories and coding (first part)

Category	Codes	Example
Reason for consultation	Aesthetics, health, bleeding, poor hygiene, implant loss, tooth loss, gingival inflammation, dental fracture, closeness to home, previous dental migration, dental mobility, economics, recommendation, need for integral treatment, prestige support from the university, implant, time and money	"Ehhh, an injury I had many years ago in the front of the front tooth and ... and bleeding problems of the gums and more than anything had ... in the front teeth and that led me to detect that I had problems to the gums, bleeding "
Discovery of the condition	Fear, he does not know if he can pay, it is not clear what reaction he had, amazement, confidence in the knowledge of the specialists, fright, I felt bad, acceptance due to the need of treatment prior to implants	"... because it was also an issue of fear, because the first time I went 5 years ago or 7 years ago they told me that I had to do this procedure, which was the, like the root polish or I do not know and they put you some devices and they scraped and I said horrible "
Explanation of the treatment	He understood, he understood the procedure, he understood partially, he understood once that he was seen in graduate school	"No, if they did ... they explained to me that it was a matter of cleaning the edge of the teeth a bit with the gum because eehhh, the gums are retracted"
Deal with the professional	Relief, trust, support, help, good treatment, learning, welcoming, empathy, good disposition, trust because the attendant was very worried about his treatment, (was not asked), closeness	"If even she cared, she gave me even this toothpaste to carry in my wallet, she gave me toothbrushes ... I felt that she worried about me so much, I do not know why, I was really a patient nothing else, then but if she worried, she saw my case and I felt that my case mattered to her "

Table 3: Summary of categories and coding (continued)

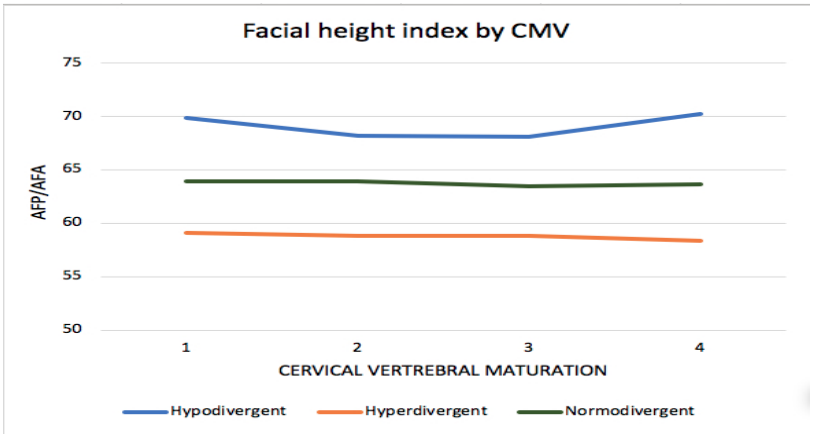
Category	Codes	Example
Consequences of not having been treated	Aesthetic problems, I would have lost teeth, do not know, I would be with a prosthesis, (I was not asked), I would have lost teeth and implants, I would have accepted my condition as normal	"Umm, I could even have lost the implants, because I was like that, because the Cone Beam saw that it was a few millimeters away from something worse, then because that was her concern, that's why it was the first thing that made me ... "
Experience during treatment	Nervousness, endurable pain, patience, resignation, scare to the machine, pain, discomfort with the machine, better than expected, exhaustive, invasive, progressive improvement, complete, enriching, noisy, do not remember	"Actually it was very enriching, because one, I was cleaning myself, I was going to do a cleaning once a year, but not as deep as here"
Post-treatment consequences	Discomfort, pain, sensitivity, do not feel anything in relation to periodontics, delicate	"Mmmm, well, it

Indications given	NSAIDs in case of pain, brushing, not smoking, hygiene instruction (type of brush and paste, type of brush and paste, interdental use, frequency and brushing technique, brushing technique, interdental, paste, brush type; brushing, hygiene items, management of dentin hypersensitivity, meals, use of electric brush, inteproximal and unipenacho)	"Yes, no, well, actually it could be good, if there was a lot of pain or some pain or a lot of pain I had to take some medication like Ibuprofen ... I have to wash 4 times a day ... I have to use dental floss, which I have to use, well, rinse ... I used to rinse, so ... And a, a special brush "
Satisfaction	Positive, satisfied, improvement in bleeding, improvement in quality of life, you do not know, you must continue with your care, it affects you throughout the treatment (implants), grateful, relief, in confidence, without changes in the quality of life, no note positive changes, indifferent	"I don't know, the truth ... I don't know if the gums have turned a bit to position in the position they should or not, because no, I have not been able to have an evaluation lately. Mmmm, I don't know, no difference. I think that means that it was not as bad as the dentist who thought to do it could have thought, I don't know ... "

Craniofacial Growth Phenotypes in Different Stages of Cervical Vertical Maturation

J. A. Briceño Risso[1], J. Morales[1], D. Droguett[1], V. Risso[2], F. Biskupovic[3]
[1]Universidad de los Andes, [2]Universidad de los Andes, [3]Universidad de los Andes

Objectives This study aims to determine the presence of hypodivergent (A), normodivergent (N) and hyperdivergent (H) phenotypes in the different stages of cervical vertebral maturation (CVM).
Methods Teleradiographs were randomly chosen from patients (between 5 and 14 years old) treated at Universidad de los Andes Clinical Center in San Bernardo during 2018.
A cephalometric study was done to determine each phenotype (classified by posterior and anterior facial high AFP/AFA, modified from a previous study). Then, divided into 6 groups according to Bacceti`s cervical maturation stages . A descriptive analysis using measures of central tendency and dispersion of CVM groups with each phenotype was performed (SPSS®).
This study was approved by the scientific and ethical board of Universidad de los Andes, Chile.
Results 316 cephalometric studies were made. All CVM groups were described, except CMV 6 because of the small sample number. The AFP/AFA mean values were: CVM1 (A:69,9; N:63,88; H:59,12), CVM2 (A:68,18; N:63,92; H:58,79), CVM3 (A:68,16; N:63,45; H:58,86), CVM4 (A:70,26; N:63,68; H:58,35), CVM5 (A:71,0; N:64,14; H:60,3).
Conclusions Hyperdivergent phenotype is characterized by a vertical growth of mandible, it`s frequently underdiagnosed and difficult to treat. Craniofacial development can be evaluated by CVM. By evaluating the correlations between both, it could indicate hyperdivergent patients in the early stages of their development.
This study suggests that early detection (on CVM1) of hyperdivergent patients may be possible since phenotypes remain stable during growth.
As CVM develops, the hypodivergent group decreased their AFP/AFA values, until the pubertal peak, where it increased, probably by late mandibular vertical growth. Normodivergents group remained stable over time. Finally, hyperdivergent group remained stable under the norm, until after the growth peak, where it tended to slightly decrease, maintaining its phenotype.



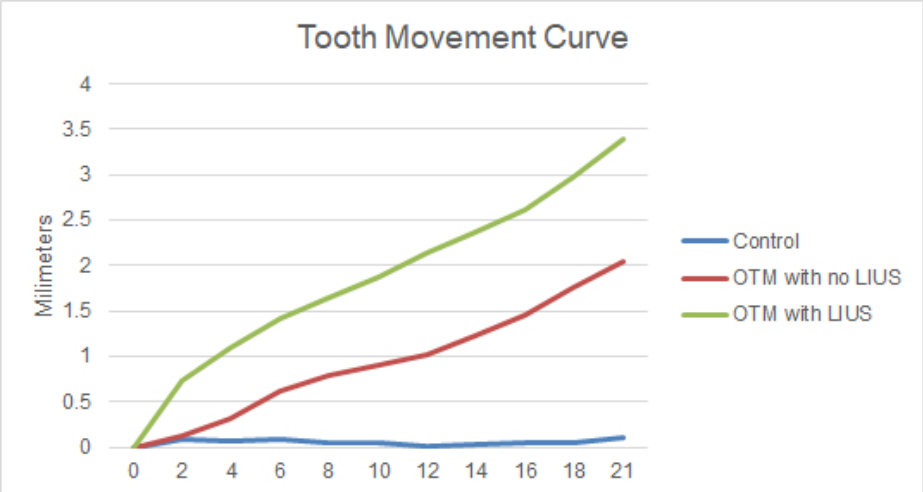
Average facial height index by CMV

	CMV1	CVM2	CMV3	CMV4
Hypodivergent	69.9	68.16	68.12	70.26
Normodivergent	63.88	63.92	63.45	63.68
Hyperdivergent	59.12	58.79	58.86	58.35

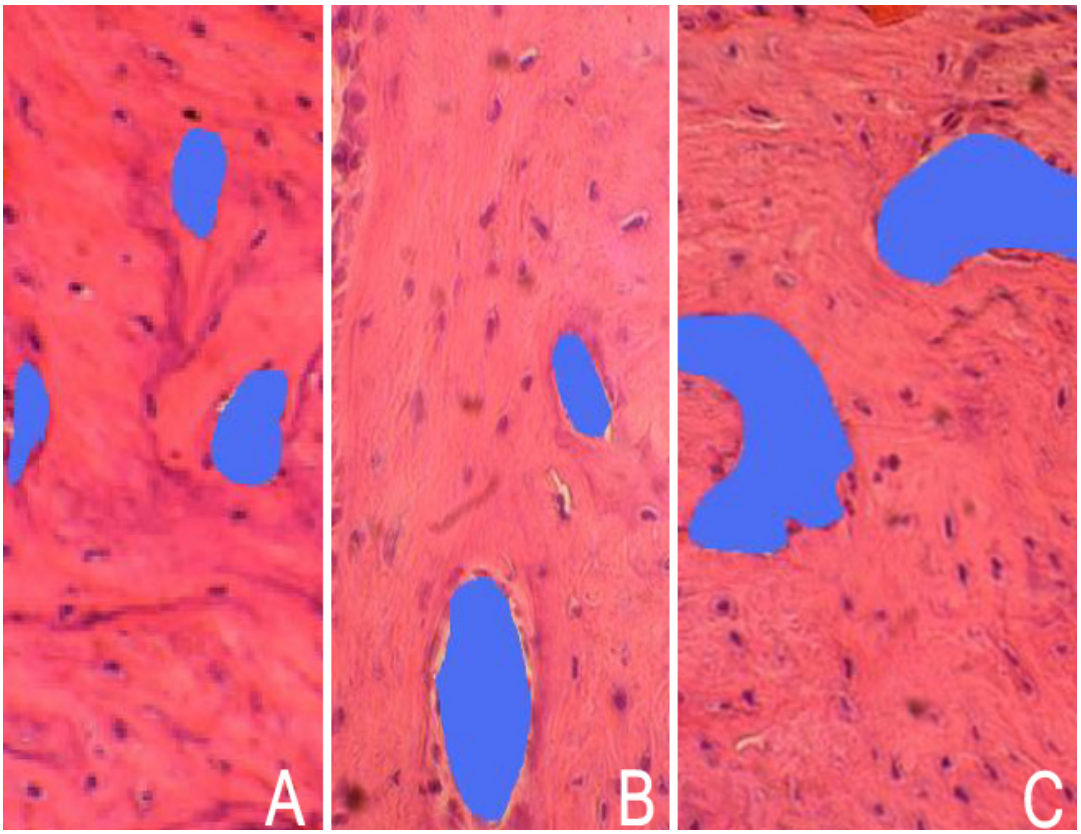
Effect of Low Intensity Ultrasound in the Orthodontic Dental Movement

C. Gajardo, V. Rojas, R. Oyonarte
Universidad de los Andes

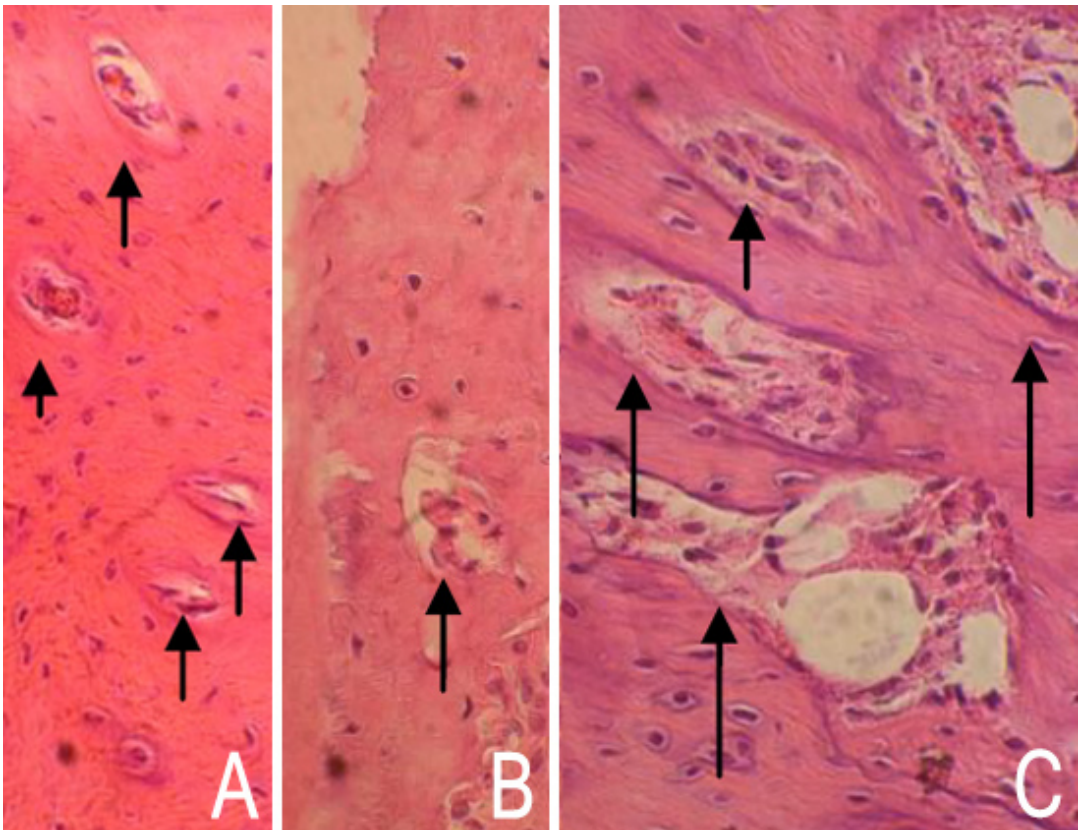
Objectives This study was carried out with the purpose of analyzing the effect when applying Low Intensity Ultrasound (LIUS) waves on the speed and distance of dental movement, and its effect at the histological level in Sprague-Dawley rats.
Methods Twenty-three male Sprague-Dawley rats were part of the experiment, which were randomly divided into three groups. Five rats were used as control with no orthodontic tooth movement (OTM), nine rats were subjected to an application of orthodontic force with no application of LIUS and nine were subjected to an application of orthodontic force with LIUS. These orthodontic forces were performed between the buccal mesial aspect of the first upper left molar and the upper central incisor, pulling the molar mesial, applying an approximate force of 50 grams during 21 days, due to problems with sedation these last two groups were composed of six and eight rats respectively.
Results In the OTM group with no LIUS, a reduction in the space between molars and incisors of 2 mm was recorded, in the OTM group with LIUS, this reduction was 3.4mm, this difference being statistically significant. Histologically, the OTM with LIUS group showed an increased vascular perimeter and marrow spaces compared to the other groups, however, no significant differences were found in the number of osteoclasts.
Conclusions It was possible to observe and demonstrate quantitatively that the LIUS is a form of efficient mechanical stimulation for the OTM acceleration over an experimental period of 21 days, significant differences were observed between the control group, the OTM group with no LIUS and the OTM group with LIUS in the magnitude of tooth movement. A greater vascularity was observed in the LIUS group, expressing larger vascular perimeters, this could be due to the stimulatory effect of ultrasound on angiogenesis. The increase in angiogenesis and marrow spaces is associated with a facilitation of the OTM.



In the groups OTM with no LIUS and OTM with LIUS an initial movement phase is observed between days 0 and 4, with a greater movement in the group with LIUS application, later a latency phase evident between days 4 and 10. In the group OTM with LIUS, a phase of progressive movement is observed more accentuated from day 10 onwards, which is also observed from day 10 in the group OTM with no LIUS



Vascular Perimeter (A) Control Group. (B) OTM with no LIUS. (C) OTM with LIUS



Marrow Spaces (A) Control Group. (B) OTM with no LIUS. (C) OTM with LIUS

Anticariogenicity of Fatty Acids in an Experimental Caries-Biofilm Model

M. J. Fuentes[1], R. A. Giacaman[2]
[1]University of Talca, [2]University of Talca

Objectives A protective effect of dietary unsaturated fatty acids has been reported, as they would induce a decrease in the cariogenicity of *Streptococcus mutans* biofilms and inhibition of enamel demineralization. However, the effect of other fatty acids or the combination of the already tested stearic, oleic, linoleic in a matrix with surfactant is unclear. Therefore, the aim was to test the anti-cariogenic potential of emulsified fatty acids in a biological model of caries, *in vitro*.
Methods Enamel slabs were used to grow *S. mutans* biofilms. Once mature, biofilms were exposed 3 times per day to 10% sucrose for 5 minutes and then to a panel of different fatty acids or to combinations, at a final 10mM concentration and dissolved with tween 80. Positive and negative controls were included. Spent media were used to measure pH twice per day, after each exposure to fatty acids. After 5 days, biofilms were evaluated for biomass, viable microorganisms and the slabs were assessed for the percentage of surface hardness loss to estimate demineralization. Three independent experiments, each in triplicate, were carried out (n = 9). Outcomes were compared among the fatty acid groups using ANOVA and Tukey with a significance level of 95%.
Results Biofilms exposed to 18-carbon fatty acids with surfactant agent induced a reduction in the demineralization of enamel and viable microorganisms when compared to a cariogenic control ($p < 0.05$). Palmitic acid and the mixtures failed to show a reduction in demineralization. No statistically significant differences in acidogenicity and biomass were observed across the experimental fatty acids or their combinations ($p > 0.05$).
Conclusions In conclusion, a potential anti-caries effect for the 18-carbon fatty acids, either saturated or unsaturated is confirmed. Unlike previous reports, emulsified stearic acid also has a potential anticariogenic properties. Further research is strongly advised. Funding: Fondecyt 1140623 to RAG.

Relationship Between Craniofacial Growth Phenotypes and Skeletal Classes

F. Biskupovic, D. Vicuña, F. Keith
Universidad de los Andes

Objectives Skeletal classes represent characteristics in the sagittal plane, however, they must be related to all the dimensions for a better diagnosis. In a vertical plane, the growth phenotype could be related to sagittal aspects and may produce anteroposterior mandibular rotations. The aim of this study was to relate vertical characteristics of hypo (A), normo (N) and hyperdivergent (H) phenotypes to sagittal characteristics of skeletal classes.
Methods 316 teleradiographs were measured cephalometrically. This study was approved by the scientific and ethical board of Universidad de los Andes, Chile. Subjects were classified by phenotype according to Anterior Face High/ Posterior Face High and Sella Nasion / Gonion Gnathion angle, modified by a previous exploratory study. Four variables were measured in the different subjects (SNA, SNB, ANB, and mandibular body length), and related to craniofacial phenotypes. The descriptive analysis was made with measures of central tendency and dispersion. The relationship was measured with an ANOVA test (Stata 5.0).
Results Regarding the SNA and SNB angles, significant differences ($p = 0.00$), were found among all the phenotypes, both angles were reduced in hyperdivergent compared to the other groups (A - H: $p = 0.00$; N - H: $p = 0.00$). Regarding the ANB angle, significant differences ($p = 0.00$), were found, the hyperdivergent group had higher values than the other groups (A - H: $p = 0.001$; N - H: $p = 0.008$). Concerning the length of the mandibular body, significant differences ($p = 0.004$), were found, where hyperdivergent had smaller mandibular bodies (A - H: $p = 0.053$; N - H: $p = 0.004$).
Conclusions There is a positive relationship between Class II skeletal values with the hyperdivergent phenotype. Similar results in SNA, SNB and ANB were found in literature, this could be explained by the posterior rotation of the mandible.

The Psycometric Properties of the Psychosocial Impac Questionnaire of Dental Aesthetics

C. A. Atala[1,2], G. Corsini[2,3], A. Jans[1,2], C. Atala[1,4], J. Montiel[5]
[1]Universidad de La Fontera, [2]Universidad de La Fontera, [3]Universidad de La Fontera, [4]Universidad de La Fontera, [5]Universidad de Valencia

Objectives To evaluate the Psycometric Properties of the Impac Questionnaire of Dental Aestheticis(PIDAQ), applied to a population of adolescents form 14 to 18 years in the city of Temuco-Chile.
Methods Descriptive cross-sectional study radomized stratified of adolecents from 14 to 18 years of public subsidized and private schools ot Temuco-Urbano, who agreed to participate in this research. The sample consisted of 254 adolescents, who met all eligibility criteria, and infromed consen signed by participants or their legal guardians in case of minors. The Psychosocial Dental Aesthetics Impact Questionnaire(PIDAQ) was used. Stadistical analysis of de data was through the SPSS, statistics version 23 program.
Results The psychosocial dental aethetics Impact questionnaire (PIDAQ), presented good psychometric prperties, 74% internal consistency, 83,8% ICC reproducibility, and contruct validity through confirmatory factor analysis (CFA), was performed the Kaiser-Meyer-Olkin (KMO), statistical test and Bartlett test vielding a value of 0.896 and a statistical significance of P= 0.00, these values being high determination.
Conclusions The Psychosocial Impact of dental aesthetic questionnaire (PIDAQ) is an efficient tool for assessment the effect of dental estetics on the psychosicial status of yuong adult, fron 14 to 18 years of the Temuco-Chile population.

CUESTIONARIO PSICOSOCIAL DE IMPACTO ESTETICA DENTAL (PIDAQ).

Estimado (a): Junto con saludarte, solicitamos un minuto de tu tiempo para realizar esta encuesta que tiene relación con el impacto psico-social de tu estética dental, es decir, ¿Cómo te sientes personalmente y socialmente con tus dientes?

MARCA CON UNA X LA RESPUESTA QUE MAS TE ACOMODE

N°_____ EXAMINADOR: _____

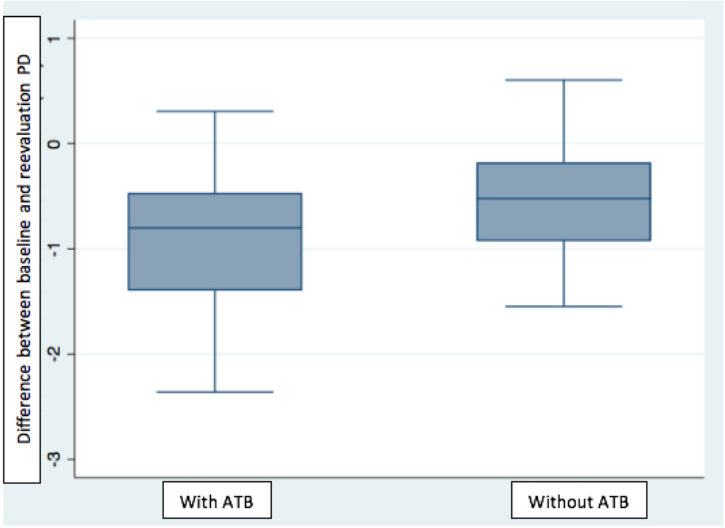
ESTABLECIMIENTO:		**FECHA**				
EDAD:		**GENERO**	**F**	**Tratamiento de ortodoncia**		
CURSO:			**M**	**SI___ NO___**		
	PREGUNTAS	**Muy en desacuerdo**	**Desacuerdo**	**Algo**	**Acuerdo**	**Muy de acuerdo**
1.	Estoy orgulloso/a de mis dientes					
2.	Me gusta mostrar mis dientes cuando sonrio					
3.	Estoy contento cuando veo mis dientes en el espejo					
4.	Mis dientes gustan a otras personas					
5.	Estoy satisfecho/a con el aspecto de mis dientes					
6.	Encuentro agradable la posicion de mis dientes					
7.	Evito mostrar mis dientes cuando sonrio					
8.	Cuando estoy con gente que no conozco me preocupa lo que piensen de mis dientes					
9.	Tengo miedo de que la gente pudiera hacer comentarios despectivos sobre mis dientes					
10.	Soy algo timido/a en las relaciones sociales d debido al aspecto de mis dientes					
11.	Sin darme cuenta me cubro la boca para ocultar mis dientes					
12.	A veces pienso que la gente me esta mirando los dientes					
13.	Me molesta que hagan comentarios sobre mis dientes, aunque sea en broma					
14.	A veces me preocupa lo que piensen las personas de sexo opuesto sobre mis dientes					
15.	Envidio los dientes de otras personas cuando son bonitos					
16.	Me fastidia ver los dientes de otras personas					
17.	A veces estoy disgustado/a con el aspecto de mis dientes					
18.	Pienso que la mayoria de la gente tiene los dientes más bonitos que los mios					
19.	Me siento mal cuando pienso en el aspecto que tienen mis dientes					
20.	Me gustaria que mis dientes fueran más bonitos					
21.	No me gusta ver mis dientes en el espejo					
22.	No me gusta ver mis dientes en las fotografías					
23.	No me gusta ver mis dientes cuando aparezco en un video					

Comparison of Clinical Parameters in Periodontal Patients Treated with Antibiotics

M. I. Rojas Bianchi, P. Rozas, A. Astorga
Universidad Mayor

Objectives Determine if there are differences in clinical parameters of patients with severe generalized chronic periodontitis (SGCP) treated with non-surgical periodontal therapy (NSPT) v/s non-surgical periodontal therapy and adjunctive systemic antibiotic therapy.
Methods A retrospective cohort study was performed with records of patients of Universidad Mayor diagnosed with SGCP. From a total sample of 45 clinical charts, 21 files corresponded to patients treated with NSPT plus systemic antibiotic therapy (Group one), and 24 files corresponded to patients treated only with NSPT (Group two). A total of 2,891 files were reviewed, from which 2,846 were excluded because they did not comply the inclusion criteria.
Results Six weeks after treatment, both groups showed clinical improvements in periodontal parameters (Probing epth, Clinical attachment level and Loe and Silness gingival index), with greater reductions in probing depth in Group one (P = 0.0352) with statistically significant differences.
Conclusions Despite the fact that adjunctive antibiotic therapy provided clinical improvements, before prescribing an antibiotic, each case should be evaluated by analyzing the patient's characteristics, systemic diseases, drug interactions and the heterogeneity of biofilm within the population, even considering the option of performing a microbiological analysis to choose the optimal antibiotic therapy that provides the best clinical results.

Graphic 1. Variation of the average of PD between Group One and Two at baseline and six weeks after periodontal treatment.



PD: Probing depth; **ATB:** Antibiotics

T Value= 2,175 y **P Value=**0,035; **T-test unpaired.**

Is there a relationship between Rheumatoid Arthritis (RA) and Clinical Attachment Loss (CAL) in patients with periodontitis?

S. d. Wen[1,2], V. J. Beltran[1], M. A. Rojas[4], A. Chaparro[3], V. Sousa[5]
[1]Universidad de La Frontera, [2]Universidad de La Frontera, [3]Universidad de los Andes, [4]Universidad de Talca, [5]UCL Eastman Dental Institute

Objectives We aimed to evaluate the association between RA and CAL in patients with periodontitis.
Methods A systematic research was carried out in the Medline, Science direct, Scopus, Liliacs and Embase databases with the terms "periodontitis", "rheumatoid arthritis", "severity", "extent", "distribution" and "complexity" using "AND" and "OR" as Boolean terms.
Results Five hundred and thirteen articles were obtained in total. After elimination of duplicates and selection by title, abstract and finally full text, 13 articles were finally included. Patients with RA had higher CAL than controls without RA. The most part of patients with RA in the studies were located in stage II severity of periodontitis, as estimated by the average of CAL and the percentage of bone loss.
Conclusions Periodontal treatment in the early stages of periodontitis would help decrease bacterial levels. This situation could positively influence RA activity. However, longitudinal studies of larger samples are required to investigate the causality of the relationship.

Mechanical Behaviour of Bulk-Fill Composite Resin After Different Challenges

D. Gonçalves, L. Oliveira, F. Ramos, T. C. Fagundes
São Paulo State University (Unesp), School of Dentistry, Araçatuba

Objectives The aim of this study was evaluate the microhardness (KH) and superficial roughness (SR) of bulk-fill composite resin compared to conventional resin after different challenges.
Methods Sixty specimens (diameter: 5mm; height: 4mm) were obtained from two composites resin: bulk-fill (Filtek One Bulk Fill - BK, n=30) and conventional (Filtek Z350 XT - FT, n=30). After polishing, the specimens were coated with nail varnish for create a control side and subjected to challenges in different solutions: Saliva (pH 7.0); Coca-Cola (pH 2.93) and pH cycling (DES: 4.0) during 15 days. The solutions were changed every day, and the specimens were stored in remineralizing solution (pH 7.0) at the end of each challenge until next day. The nail varnish was removed after the experimental period and the analysis were performed. Data were analyzed through ANOVA two-way repeated measures test with a significance level of 5%.
Results Regarding the KH, comparing materials submitted the same challenge, BK showed higher values than FT only for saliva. BK specimens suffer the action of pH cycles and immersion in Coca-Cola, since lower values were obtained after these challenges if compared to saliva. FT specimens presented similar KH values for all storages. There was no statistical significant difference between groups for SR data.
Conclusions In conclusion, in spite of the hardness of Bulk-fill composite resin had been affected by the challenges proposed, both types of composite resins were similar hardness.

Extracellular Vesicles in Periimplant Gingival Fluid of Patients with Periimplantitis, Perimucositis and Healthy Implants

O. Realini[1], P. Atria[2], D. Albers[1], V. J. Beltran[3], A. Chaparro[1]
[1]Universidad de los Andes, [2]Universidad de Los Andes, [3]Universidad de la Frontera

Objectives To identify the presence of extracellular vesicles (EV) (microvesicles and exosomes) in peri-implant gingival fluid (PIGF) in patients with healthy implants (HI), perimucositis (PMI) and periimplantitis (PPI); and relate its concentration to different periimplant clinical variables
Methods 12 patients were recruited with a total of 38 osseointegrated implants.13 of them were diagnosed as HI, 12 as PMI and 13 with PPI. Clinical variables of periimplant probing depth, bleeding and suppuration on probing, smoking, plaque index, and history of periodontal disease were recorded. PIGF samples were taken from all patients, and they were processed for the isolation of EVs with ExoQuick®. Its quantification was performed using Nanoparticle Tracking Analysis and its morphological characterization with transmission electron microscopy

Results A higher EVs total concentration (p = 0.0006), exosomes (p = 0.005) and microvesicles (p = 0.005) were observed in patients with PPI compared to HI. Also, in PIM compared to HI, were observed a significantly increase in the concentration of total EVs (p = 0.001), exosomes (p = 0.007) and microvesicles (p = 0.0009). In addition, PPI patients presented higher severity of periodontal disease (p = 0.018), bleeding on probing (p = 0.002), and periodontal probing depth of implants (p = 0.009).
Conclusions Patients with PPI and PMI have significant increases in total EVs, microvesicles and exosomes in PIGF compared to healthy implants.

Efficacy of mechanized file systems on the reduction of a multispecies anaerobic biofilm: an *ex vivo* study
E. A. Muñoz Jiménez, G. Sánchez-Sanhueza, J. Aranís Jiménez, F. Alarcon Moyano, M. Quezada, H. Bello-Toledo
Universidad de Concepción

Objectives To determine the efficacy of different instrumentation systems on the reduction of a multispecies anaerobic biofilm on extracted human molars.
Methods The palatal roots of fifteen extracted maxillary molars were used for this study. After sonication and sterilization, development of a multispecies anaerobic biofilm (7 species) was induced by storing the apical third portion of the roots in an anaerobe broth for 21 days. Root canals were prepared at working length (9 mm) using one of the following instrumentation systems: Reciproc Blue R40(n=3), Wave One Gold (WOG) Medium(n=3), XP-endo Shaper(n=3) and K Flexofile 15-40(n=3). Three samples were left without any preparation (control group). Bacterial viability was determined using a LIVE/DEAD® BacLight™ Kit (Invitrogen, CA). Two- and three-dimensional images of the apical third (3 mm) of the root canals were obtained using confocal laser scanning microscopy (LSM 780, ZEISS, Germany) and further analyzed with the IMARIS software (v. 7.5.2, "Measurement Pro module", USA). The relative biofilm removal after instrumentation was determined for the 2D and 3D images using respectively areal and volumetric parameters. Statistical analyses were conducted using Infostat (2014p)
Results None of the instrumentation systems used was able to completely remove the bacterial biofilm at the apical third of the root canals. The 2D analysis revealed a significantly higher bacterial reduction for Reciproc Blue treated roots when compared to WOG Medium and XP-endo Shaper ($p<0.05$). However, no differences were observed between mechanized systems in the 3D analysis. Manual instrumentation (K Flexofile) displayed the lowest bacterial reduction among all systems.
Conclusions Within the limitations of this study, it can be concluded that mechanized instrumentation is unable to completely clean the apical portion of the root canal, although it provides a significant improvement with regard to manual instrumentation. Reciproc Blue shows higher bacterial reduction compared to WOG Medium and XP-endo Shaper.

Cariogenic Potential Of Liquid Sweeteners Commercialized In Chile, In Vitro.
C. F. Field Donoso, N. L. Garcia, R. A. Giacaman
University of Talca

Objectives Artificial sweeteners in different formats have been developed as sugar substitutes. Our group previously demonstrated that solid commercial sweeteners retain a cariogenic potential, but no information is available on the caries potential of the liquid sweeteners widely available in the market. Furthermore, the effect of these compounds has been tested in their pure, rather than the commercial form. The goal of this study, therefore, was to analyze the cariogenic potential of liquid sweeteners commercialized in Chile.
Methods An in vitro study with a biological model of caries on enamel slabs with *Streptococcus mutans* UA159 biofilms was used. Six liquid sweeteners commercialized in Chile were analyzed: Saccharin, Sucralose, Tagatose, Fructose, "Balanced" Stevia and Pure Stevia. After biofilm formation, the slabs/biofilms were exposed for 5 days, 3 times per day for 5 min to the treatments, in similar quantities, with the corresponding positive and negative controls. Media pH was monitored twice per day. At the end of the experiment, the following outcomes were assessed: acidogenicity, loss of surface hardness (demineralization) and from the biofilms the biomass and viable cells was analyzed. The entire experiment was repeated three times, each in triplicate (n=9).
For the statistical analysis, ANOVA and Tukey with a level of significance of 95% were used.

Results Results indicated that the different sweeteners induced an overall reduction of about 35% on acidogenicity and over the enamel demineralization, when compared to 10% sucrose, used as the caries-positive control ($p<0.05$). All the tested products resulted in higher demineralization and pH than the caries-negative control (p but higher than the negative control ($p<0.05$). No significant differences we observed on biomass and viable cells among all the sweeteners.
Conclusions In conclusion, liquid sweeteners marketed in Chile are less cariogenic than sucrose, but they retain the ability to induce demineralization and should be recommended with caution.

Pattern of Skeletal Class in Orthodontic Population with Agenesis
N. M. Abdala[1], K. Y. Yagnam[1], V. A. Román[1], C. A. Tapia[2]
[1]Universidad del Desarrollo, [2]Universidad Diego Portales

Objectives The skeletal class is a factor to be considered in the planning of orthodontic treatments, which may be influenced by different characteristics, one of them being dental agenesis. The objective of the study was to determine the most frequent skeletal class in the Chilean population evaluated in orthodontics with dental agenesis.
Methods A transversal descriptive study was designed, composed of 9207 patients evaluated in orthodontics in a private center, applying the following inclusion criteria: patient who entered the evaluation between January and December 2017, between 5 and 43 years, diagnosis of agenesis of one or more tooth performed by radiologist through report and confirmed by orthodontist; and exclusion: radiographs of patients with previous orthodontic treatment, with syndromes and / or with previous extractions without registration of the tooth that was extracted or without knowledge of its absence. The skeletal class was recorded according to the location of the presented agenesis.
Results A total of 277 patients with agenesis (174 women and 103 men) were obtained, representing a prevalence of 3%. There were more cases in the jaw and in the premolars. A frequency for skeletal class I of 29.96%, skeletal class II of 45.12% and skeletal class III of 24.92% was found.
Conclusions The most prevalent skeletal pattern for the Chilean population with agenesis was the class II skeletal. This frequency may vary according to the characteristics of the population.

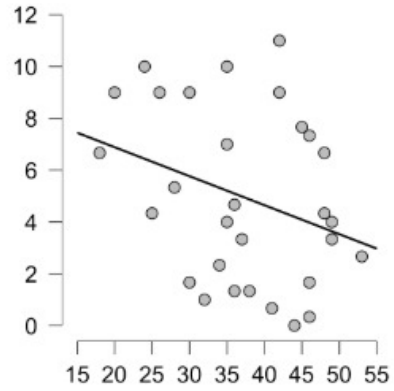
Correlation between Salivary Flow and Xerostomy Severity in Adults
S. Peragallo, F. Ortiz, A. Bustamante, C. Ruiz, M. Aedo, C. Berrios
Universidad de Valparaíso

Objectives Determine the level of correlation between unstimulated salivary flow and severity of xerostomia in adult patients.
Methods A cross-sectional observational analytical study was performed at the faculty of dentistry of the University of Valparaíso, in which 30 patients who had xerostomia were selected according to the Fox, Bush and Baum survey. Salivary flow was measured with the Oral Schirmer's test and the severity of xerostomia responding to the Thomson's "Xerostomia Inventory" translated and validated into Spanish. These data were subjected to a statistical analysis with Pearson's correlation coefficient through Stata 14™ software.
Results A weak and inverse relationship of -0.312 between salivary flow and severity of xerostomia was determined using Pearson's correlation coefficient.
Conclusions The greater the non-stimulated salivary flow, the lower the severity of the xerostomia in adult patients. Considering the results, it is recommended to maintain this research mainly by observing a more representative population which allows to determine more precisely the level of correlation between the non-stimulated salivary flow and the severity of xerostomia.

Correlation Matrix

Pearson Correlations

		VEL	SUM THO
VEL	Pearson's r	—	
	p-value	—	
SUM THO	Pearson's r	−0.312	—
	p-value	0.093	—



Adhesion of *Streptococcus mutans* on Ceramic with Different Polishing Protocols

I. Catanoze[1], H. de Souza[1], V. R. dos Santos[2], A. Pesqueira[1], C. Duque[3], A. M. Guiotti[4]
[1]São Paulo State University (UNESP), School of Dentistry, Araçatuba, Brazil, [2]UNESP - Brazil, [3]Universidade Estadual Paulista - UNESP, [4]São Paulo State University

Objectives The aim of this study was to evaluate in vitro the influence of five different polishing protocols on lithium disilicate ceramic on the adhesion of *Streptococcus mutans* biofilm.
Methods Fifty specimens of pre-sintered lithium disilicate (IPS e.max CAD) with dimensions of 5 x 5 x 1.2 mm were fabricated and divided into 5 groups: G1- positive control (Glaze Group – treatment just with glaze); G2 (Glaze Group + Wear + Glaze) – wear simulating occlusal adjustment with diamond tip and new glaze; G3 (Wear group - negative control) – wear; G4 (Ceramisté Wear Group) - wear and polishing with Ceramisté Polishing Kit (Shofu); G5 (Optrafine Wear Group) - wear and polishing with Optrafine Polishing Kit (Ivoclar). In order to observe the smoothness surface obtained after the polishing protocols of the specimens, surface roughness (Ra - μm) was evaluated. Biofilms of *S. mutans* were formed on the surfaces of the samples. For biofilm quantification, the number of cultured cells was evaluated by counting colony forming units (CFUs). The data were submitted to statistical analysis (one-way ANOVA, followed by Tukey's test, $p \leq 0.05$).
Results There was a difference in surface roughness of all groups in relation to G3 (Negative control; $p \leq 0.05$), presenting an average Ra of 1.68μm. There was no statistically significant difference between groups that were polished (G4 - 1.32μm and G5 - 1.06μm). The lowest mean roughness values were those of group G1 (positive control; 0.4μm). There was a difference in Log values (CFU/mL) only between the G3 group and the glaze groups (G1 and G2, $p \leq 0.05$). The highest adhesion of *S. mutans* occurred in group G3 (4.53 Log).
Conclusions The best polishing protocol of lithium disilicate ceramics after wear is glazing on surface, presenting the lowest values of roughness and CFUs.

Association Between Periodontitis And Psoriasis: Preliminary Study.

J. Briceño Moya[1], R. Díaz[1], A. Fernandez[2], C. Jimenez[2], J. Fernández[3], D. Carvajal[3], G. Navarro[1]
[1]Universidad Andrés Bello, [2]Universidad Andrés Bello, [3]Universidad de Chile

Objectives To compare the presence of periodontitis and oral hygiene habits among individuals with psoriasis and healthy individuals.

Methods

Case-control preliminary study of patients with psoriasis and without it. Patients older than 18 years with psoriasis vulgaris, and patients without it and systemically healthy were included. The psoriasis area and severity index (PASI), number of teeth, dental hygiene habits were evaluated, and the presence and severity of periodontitis was determined according to diagnosis criteria of poblational studies on periodontitis in relation to probing depths and clinical attachment levels in gums. In the analysis Fisher's exact test, Mann-Whitney U test and logistic regression were used, with a significance level of 0.05.

Results A total of 47 patients with psoriasis and 46 healthy controls were included. The psoriasis group had an average age of 47.58 ± 13.60 years, 56.25% were men, and the control group 37.93 ± 12,36 years, 43.75% were men ($p<0.001$ and $p=0.215$, respectively). Patients with psoriasis presented severe, moderate and mild or absence of periodontitis in 47.83%, 26.09% and 10.87%, respectively, while controls 21.28%, 25.53% and 6.38% respectively, presenting differences in severe periodontitis between cases and controls ($p=0.004$). Patients with psoriasis had an average of 22.15 ± 4.76 teeth and a brushing frequency of 2.20 ± 1.02 times a day, while the control group presented 25.12 ± 3.13 teeth and frequency of brushing 2.70 ± 0.83 per day ($p<0.01$ respectively). Patients with psoriasis are 8.3 times more likely to have mild periodontitis than controls (Odds ratio 95% CI: 1.36-50.38), and 8.3 times to have severe periodontitis than controls (Odds ratio 95% CI: 1.05-12.58). No association was found between the severity of periodontitis and the severity of psoriasis.

Conclusions Patients with psoriasis had a higher frequency of mild and severe periodontitis, fewer teeth and less daily brushing habits in comparision to control patients.

Effects of Tooth Bleaching on the Shear Bond Strength of Orthodontic Brackets

M. Gómez, V. Rojas, C. Sampaio, M. Sáez
Universidad de los Andes

Objectives To evaluate the effect of three bleaching agents on the shear bond strenght (SBS) of metal brackets and to compare their SBS.

Methods Brackets were cemented on 76 human premolars surfaces extracted by orthodontic indication (76 = sample size). 4 groups were stablished: (0) Control, (1) enamel treated with peroxide of Carbamide 16%, (2) Hydrogen Peroxide 35% and (3) Hydrogen Peroxide 10% Whitening strips. All brackets were cemented with Transbond XT (3M, Unitek, USA). Once the adhesive protocol was completed, all samples were treated with 5,000 cycles of thermocycling. Shear bond strength was evaluated with a Bisco machine and the amount of adhesive material at the base of the brackets with optical microscopy according ARI index. Shapiro-Wilk test was applied to perform the normality test data. Kruskal-Wallis test was used to compare groups, and the Mann-Whitney test for the comparison between pairs of groups.

Results The results of adhesive resistance to shear bond strenght for groups 0, 1, 2, and 3 were 12.64, 11.06, 6.4 and 9.34 MPa respectively with a statistical difference between the groups ($p <0.05$). ARI index was significantly different in some groups ($p <0.05$), indicating failures within the bondig cement. Cohesive type for control, adhesive type for group 2 ($p <0.05$) and adhesive faults (resin/enamel interface) with cohesive characteristics for groups 1 and 3.

Conclusions The 35% hydrogen peroxide office bleaching agent significantly reduces adhesion values in the metal brackets cemented 24 hours after bleaching and thermocycling.

Automatic Extraction of Features From Unstructured Dentistry Referrals.

F. Cordero[1], F. Cáceres[2], F. Villena[3]
[1]Universidad Nacional Andres Bello, [2]Universidad Andres Bello, [3]Universidad de Chile

Objectives To extract keywords from unstructured text of a database of referrals from the Clínica Odontológica UNAB (COUNAB), between 2017 and 2019.
Methods COUNAB referrals were extracted from the U-Smile platform. Each referral contains information regarding administrative data, the specialty to be referred and the observation which is a narrative describing the reason for referral. The observation of each of the referrals was analyzed, which is in the form of unstructured free-text. The TF-IDF (Term Frequency - Inverse Document Frequency) method was used for the weighting of the importance of each word in the referral. This method returns a numerical value describing the level of relevance of each word to differentiate the referral from the rest, utilizing the frequency of the word in the referral and frequency of the word on the entire dataset to perform the relevance weighting.
Results 924 referrals were obtained. The specialty with more referrals was Endodontics with 245 referrals. The keywords from each one of the referrals were obtained. The words with lower IDF values (providing less information in the referral) were patient, treatment and tooth, and those with higher IDF were nocturnal, neurological and complication.
Example of an automatic keyword (*) extraction using our proposed method: I am requesting evaluation and treatment possibility for partially edentulous* patient. History of hypertension* and diabetes*.
Conclusions The important words retrieved by the method were the determinants to establish differences between referrals. With this method it is possible to explore unstructured data intuitively to extract important information in a more efficient way. This tool would help students and professionals in the selection of patients based on a given query, lowering the time consumed in searching patients. Using the TF-IDF method, the most important words were extracted within the observation attribute of each of the referrals.

Microstructural Characterization Of Tooth Surfaces In Recessive Dystrophic Epidermolysis Bullosa

M. Solar López[1], S. Krämer Strenger[1], C. Covarrubias[2]
[1]Universidad de Chile, [2]Universidad de Chile

Objectives Characterize the structure and composition of heathy tooth surfaces of patients with recessive Dystrophic Epidermolysis Bullosa (RDEB) using scanning electron microscopy (SEM) coupled with energy dispersive X-ray analysis (EDX).
Methods Extracted teeth of 3 patients with RDEB were analyzed. The tooth samples were dried by using supercritical CO_2 equipment, gold coated in a Denton Desk V coater, and then examined in a JEOL JSM-IT300LV SEM microscope coupled with EDX detector for compositional analysis.
Results SEM examination revealed that the teeth of patients with RDEB present an irregular surface, porous and disorganized structure as compared to a health enamel surface. EDX compositional analysis indicated that tooth of patients with RDEB contains higher Carbon content and lower Phosphorous and Calcium concentrations than those of a health tooth enamel.
Conclusions Tooth surfaces of patient with RDEB present an altered microstructure with lower mineral content than that of a health tooth surface.

Photobiomodulation Of Fibroblasts In Contact With Titanium And Zirconia Surfaces

T. N. Pansani[1], F. G. Basso[1,2], C. de Souza Costa[1]
[1]UNESP – Univ. Estadual Paulista, [2]Universidade de Ribeirão Preto - UNAERP

Objectives The attachment of connective tissue to implant abutments prevents the apical migration of the epithelium and the bone crest reabsorption commonly observed in peri-implantitis. Therapies capable of promoting cell adhesion and modulating tissue inflammation may improve the aesthetic and functional conditions following prosthetic rehabilitations. The aim of this study was to assess the response of gingival fibroblasts seeded on titanium (Ti) and zirconia (ZrO_2) surfaces, submitted to low-level laser irradiation (LLLI) and then exposed or not to lipopolysaccharide (LPS).

Methods After being seeded on Ti and ZrO_2, the cells were irradiated for 3 times (InGaAsP; 780nm, 25mW) at 24-hour intervals, using 0.5; 1.5 and 3.0 J/cm^2 doses, and exposed or not to LPS from *Echerichia coli* (1 mg/mL). Cell viability (Alamar Blue, n=8), interleukin 6 (IL-6) and 8 (IL-8) synthesis (ELISA, n=6), IL-6 and vascular endothelial growth factor (VEGF) gene expression (qPCR, n=5) were assessed and statistically analysed (One-Way ANOVA, a=0.05). Cell morphology was evaluated by fluorescence microscopy (Confocal).
Results Increased cell viability occurred in all groups cultured on Ti surfaces compared to control, except for the LPS-exposed cells. Fibroblasts cultured on ZrO_2 surface and exposed to LPS exhibited reduced viability. LLLI at 3.0 J/cm^2 and1.5 J/cm^2 down-regulated IL-6 synthesis by cells seeded on Ti and ZrO_2 surfaces, as well as IL-8 synthesis by cells seeded on ZrO_2 surface, respectively. Cells seeded onto both surfaces and exposed to LPS showed increased IL-6 gene expression; however, this activity was down-regulated the fibroblasts were submitted to LLLI at 3.0 J/cm^2. Increased VEGF gene expression was observed in fibroblasts seeded on Ti surfaces and laser irradiated (3.0 J/cm^2). Distinct patterns of cytoskeleton changes occurred in the laser-irradiated cells exposed to LPS.
Conclusions Specific parameters of LLLI can biomodulate the inflammatory response of gingival fibroblasts seeded on Ti or ZrO_2 and exposed to infectious agents.

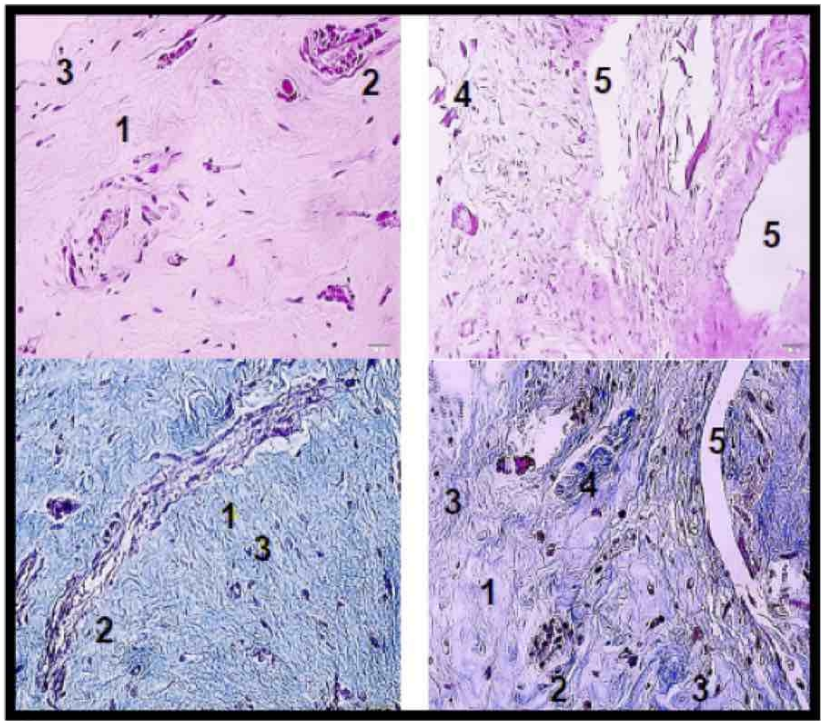
Development of new biomaterials based on polyamide and sodium trimetaphosphate for biomineralization
L. A. Morais[1], F. N. Souza-Neto[1], D. M. Santos[2], T. Y. Hosida[1], T. P. Cavazana[1], E. Frollini[2], S. Campana Filho[2], E. Camargo[3], A. C. Delbem[1]
[1]São Paulo State University (UNESP), [2]University of São Paulo (USP), [3]Federal University of São Carlos (UFSCar)

Objectives The aim of this study was to obtain a biomaterial based on Polyamide 6.6 (PA6.6) and of sodium trimetaphosphate nanoparticle (TMPn) at different concentrations and to evaluate its physicochemical properties for possible dental application.
Methods TMPn was obtained from the mechanical milling process for 48h. The nanocomposites were obtained by electrospinning technique with the addition of 2.5, 5 and 10% TMPn w/w (TMPn: PA6.6). The nanocomposites were analyzed for their structural properties by ^{13}C solid-state NMR and FTIR technique. The morphology was evaluated by Scanning Electron Microscopy (SEM). Thermal properties were assessed TGA and DSC techniques, while the mechanical properties were evaluated by Dynamic Mechanical Analysis (DMA).
Results Grinding reduced the TMPn particle size from the micrometer scale to the nanometer scale (73.4 ± 10.4 nm), with spherical morphology and orthorhombic crystal structure. By ^{13}C NMR it was observed all chemical shifts and were assigned according to N6. By FTIR technique it was observed peaks corresponding to PA6.6 and TMPn. SEM images showed the formation of nanofibers with diameter (140 ± 37 nm) for PA6.6 and with the addition of TMP there was an increase in nanocomposite diameter, showing that TMPn increased the viscosity of the polymeric solution leading to this increase in fiber diameter. Regarding the thermal behavior of the nanocomposites, the addition of TMP increased the thermal stability of nanocomposites due to the barrier effect leading to the materials degradation at a higher temperature. Furthermore, the addition of TMP increased the glass transition temperature in nanocomposites, indicating a reduction in polymer chain mobility. Regarding the mechanical properties, the PA6-TMPn-2.5% nanocomposite presented higher elastic modulus, elongation at break and tensile strength.
Conclusions These results showed an approach for TMPn application in polymeric materials, forming stable nanofibers with potential application of the material as a biomaterial.

Histological Analysis Of Normal And Inflamed Pulp And Stem Cells
c. brizuela[1], C. Inostroza[1], M. Lagos[1], C. Araya[1], F. Carrión[2]
[1]universidad de los andes, [2]Universidad del Desarrollo

Objectives Evaluate cell morphology of healthy and inflamed human dental pulp and mesenchymal stem cells derived from these tissues.
Methods Dental pulp diagnosed with irreversible pulpitis and normal pulp explants were grown in Alpha-MEM culture medium, 10% SFB, 1% Pen Strep at 37 ° C and 5% CO_2. Pulp tissues were fixed in 10% buffered formalin for subsequent histological processing. The mesenchymal stem cells were fixed in 70% ethyl alcohol on 1.9 cm2 culture plates. Subsequently, hematoxylin-eosin and Trichrome Masson's staining of pulp tissues and mesenchymal stem cells were performed. Images were recorded in inverted optical microscopy and images were evaluated by the Image-J program.

Results There were no differences in cells characteristics and properties such as immunophenotype and tridifferentiation of cells derived from normal and inflamed pulp tissue. The histological dental pulp analysis showed different patterns between healthy and inflamed tissues. The inflamed tissue showed a mostly lax connective tissue and the nuclei were slightly stained. Mesenchymal stem cells derived from both tissues did not show differences in their morphology and phenotypic features typical of a mesenchymal stem cell.
Conclusions Both pulp tissues showed morphological differences mainly in the lax connective tissue in inflamed dental pulp, however the cells derived from them do not show changes in their morphology



Phytotherapy and alcohol free mouthwash: an important approach against oral pathogens
A. M. Vieira[1], G. L. Fernandes[1], A. A. Berretta[2], A. C. Delbem[1], A. F. Buszinski[2], W. A. Curti[1], M. R. Luciano[1], D. B. Barbosa[1]
[1]São Paulo State University (UNESP), School of Dentistry, [2]Laboratory of Research, Development & Innovation, Apis Flora Industrial e Comercial Ltda

Objectives The aim of the present study was to develop an alcohol free mouthwash phytotherapeutic formulation containing pomegranate peel extract for application, and to evaluate its antimicrobial potential. **Methods** The dehydrated and triturate pomegranate peel was subjected to maceration and filtration to obtain the alcoholic extract. This extract was concentrated in a rotary evaporator under reduced pressure and controlled temperature (40-60°C), and subsequently resolubilized in propylene glycol. Next, a formulation was prepared with the following active ingredients: 3% pomegranate peel extract, 0.3% sodium trimetaphosphate (TMP) and 225 ppm sodium fluoride (F). After the characterization of the formulation by Folin-Denis colorimetry pharmacopoeial analysis, a broth microdilution assay was performed to determine the minimum inhibitory concentration (MIC), minimum bactericidal concentration (MBC) and minimum fungicidal concentration (MFC) for the *Streptococcus mutans* (35668) and *Candida albicans* (10231) ATCC strains.
Results The concentration of phenolic compounds expressed as gallic acid in the formulation was 11.59 mg/mg. For *S. mutans* MIC and MBC values were 0.97 and 5.12 mg/mL, and for *C. albicans* MIC and MFC values were 1.95 and 4 mg/mL.
Conclusions The formulation showed antimicrobial activity against the strains tested, revealing its potential to be used in the prevention or treatment of oral diseases such as caries and candidiasis.

Effect of clenching, grinding and chewing on different physiological parameters.

M. F. Gutierrez Reyes[2,1], R. Miralles[3], N. Gamboa[2], C. Marambio[4], S. M. Valenzuela[2], A. Fuentes[2], H. Santander[3], C. Zuñiga[1], R. Bull[3]
[1]Universidad Finis Terrae, [2]University of Chile, [3]University of Chile, [4]University of Chile

Objectives To evaluate the effect of awake tooth clenching, grinding and chewing on external intercostal (EI) electromyographic (EMG) activity, heart rate and oxygen saturation in subjects with canine guidance or group function. In addition, the total chewing time was correlated to heart rate and oxygen saturation.
Methods The sample included healthy male participants, 25 with canine guidance and 25 with group function. The selection criteria included complete natural dentition, canine relationship Class I or II and no history of orofacial pain. Bilateral EMG recordings (μV) of EI muscles were performed during following tasks: clenching in the maximum intercuspal position, continuous eccentric and concentric tooth grinding, and unilateral chewing at seated upright position. Simultaneously, heart rate and oxygen saturation with a fingertip pulse oximeter were measured. For the statistical comparisons, the mean value of the three EMG recordings, heart rate and oxygen saturation obtained for each condition were used. Statistical significance was defined in $\alpha = 0.05$.
Results For canine guidance and group function, no difference among awake tooth clenching, grinding and chewing in EI EMG activity and oxygen saturation were observed. For both groups, heart rate showed higher values during chewing when compared during tooth clenching and grinding. The total chewing time did not show a correlation with heart rate and oxygen saturation. A non-normal distribution for all values ($p < 0.05$; Shapiro-Wilk test) were observed, therefore a Friedman test was used to compare these variables among tasks.
Conclusions The results suggest that heart rate is modified by a functional activity such as chewing, independent of the participant's occlusal scheme.

Antimicrobial and Synergistic Effects of Phenolic Acids on Oral Bacteria

V. R. dos Santos[1], K. S. Caiaffa[1], W. C. de Oliveira[1], J. A. Pereira[1], I. Catanoze[2], C. Duque[1]
[1]Universidade Estadual Paulista - UNESP, [2]Universidade Estadual Paulista - UNESP

Objectives This study aimed to evaluate the antimicrobial activity of phenolic acids derived from cinnamic acid, alone or in combination, against some oral bacteria.
Methods The antimicrobial activity of the following phenolic acids: cinnamic acid and its derivatives coumaric acid, caffeic acid, ferulic acid and synapic acid was evaluated by determination of Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC) on *Streptococcus mutans*, *Lactobacillus casei*, *Actinomyces israelii* and *Enterococcus faecalis* for 24h. The phenolic acids with antimicrobial effect were combined and determined the Fractional Inhibitory Concentration (CIF).
Results MIC and MBC values ranged from 0.25 (caffeic acid) to 1 mg ml^{-1} (cinnamic, ferulic and coumaric acids) for *A. israelii*. The same compounds had inhibitory effect (MIC=1 mg ml^{-1}) against *L. casei*. Cinnamic and caffeic acids presented antimicrobial effect against *S. mutans* (MIC=1mg ml^{-1}) and *E. faecalis* (MIC MBC 1mg ml^{-1}). No antimicrobial effect was observed for synapic acid. The combination of cinnamic acid and caffeic acid presented synergistic or additive effect against all bacteria tested, with FIC lower than the MIC values.
Conclusions Cinnamic acid and its derivative caffeic acid, alone or in combination, showed antimicrobial activity against all oral bacteria tested and could be promising antimicrobial agents for oral applications.

Oral Cancer: Sources of Information and Impact on Patients

K. Cordero[1], I. Espinoza[2], L. González[1], J. A. López[1]
[1]Universidad de Valparaíso, [2]Universidad de Chile

Objectives This study was aimed to determine the main sources of information on oral cancer (OC) and its impact on adult patients treated at the Dental Clinics of the University of Valparaíso (DCUV). To compare the knowledge about the existence of OC in relation to other types of cancer, to identify the sources of information and their relationship on the amount of knowledge of OC and to estimate the effect of advertising in cigarette packs on smoking habits.
Methods Descriptive cross-sectional study in 335 adult patients through a survey validated by a committee of experts and applied face-to-face in the waiting rooms of the DCUV. Data were entered by Microsoft Excel 2007 and analyzed by STATA version 11.

Results Of the total interviewees, 64% were women and 36% were men. The average age was 42 years (range 18-88 years). The 99% knew the existence of breast cancer, 97% skin cancer, 95% lung cancer and 66.57% OC. With regard to obtaining information, television and internet obtained the same value (30.15%), followed by cigarette packs (27.46%), dentist (16.42%), posters (13.43%) and dentistry students (10.45%). When qui square test was done, a p-value of less than 0.05 was obtained in all relationships, there being statistically significant evidence between the information provided by the different sources and the percentage of knowledge of OC for the sample. Regarding the effectiveness of advertising against smoking, 69% considered that it has not been effective in abandoning this habit.
Conclusions Patients treated in the DCUV showed a low level of knowledge about OC compared to other types of cancer. Television and the internet were the main sources of information. Most respondents felt that advertising in cigarette packs has been insufficient to combat this habit.

Effectiveness of bone-substitutes versus autogenous-graft for clef-palatal repair. Systematic review

J. Santander Sandoval[2], L. Brito Leal[1], N. Saavedra[3], I. Sanchez[4]
[1]Universidad autonoma de chile, [2]Universidad Autónoma de Chile, [3]Universidad Mayor, [4]Universidad Mayor

Objectives Establish effectiveness of bone-substitutes (BS) versus autogenous-bone-grafts(ABG), on treatment of alveolar cleft-palate(CP), through a systematic review of articles published between 2015-2019.
Methods Search of literature on: MEDLINE, SCIENCEDIRECT, SCIELO, EBSCO, EMBASE database where searching to identify : systematic-reviews (SR), observation studies(OS), Using MeSH "cleft palate" "synthetic bone graft" "bone graft" with the bolean AND, language: English and Spanish, published 2015 -2019., RS evaluated with the PRISMA protocol, and OS using the STROBE protocol.
Exclusion criteria: studies performed on animals; application BS, ABG in different treatment of CP, 2 authors make a review of articles, in case of conflict, a 3rd will make the jump-off.
151,595 potential articles, 9 articles were selected according to method.
Results The year of publication of articles was, 2019 = 1% (n = 1), 2018 = 44% (n = 4) ,2015-2017 22% (n = 2), no articles of relevance for the year 2016 were found. All articles were published in English.
The 55% (n = 5) are RS and 44% (n = 4) are OS, the analyzed studies compared or related the use of BS and ABG for repair of CP. No significant differences were found within use of the different types of bone-graft (BG), all the results demonstrated the efficacy of ABG and also the use of BS. The 66.7% (n = 6) evaluated bone volume.
Conclusions 5 types of BG are described, the autogenous-grafts, the isografts, the allografts, the xenografts and finally synthetic bone substitutes that have been developed to mimic the natural bone tissue.
The ABG constitutes the Goldstandar for this type of interventions, as well as the iliac-crest that corresponds to the most promoted donor site.

Effect of amorphous calcium phosphate casein and trimetaphosphate on remineralization

F. Gonçalves[2], A. C. Delbem[1], N. G. Emerenciano[2], J. P. Pessan[2], M. d. Silva[2], M. Danelon[3]
[1]UNESP, [2]UNESP - São Paulo State University, [3]São Paulo State University

Objectives The aim of the present study was to evaluate *in vitro* if the association of treatments with fluoridated toothpastes and supplemented with sodium trimetaphosphate (TMP) and amorphous calcium casein-phosphate (CPP-ACP) could increase the remineralization of initial lesions of caries.
Methods Bovine enamel blocks (n = 72) were selected for initial surface hardness (SH). They were then submitted to induction of artificial caries lesions and the post-demineralization hardness (SH1) was determined. The blocks were divided into 6 treatment groups (n = 12): 1) Toothpaste without F (Placebo); 2) Toothpaste with 1100 ppm F (1100F), 3) MI Paste Plus® (MI), 4) 1100F associated with MI Paste Plus® (1100F + MI), 5) 1100F + 3% TMP (1100F/TMP) and 6) 1100F + 3% TMP associated with MI Paste Plus® (1100F/TMP + MI). The blocks were submitted to 6 pH cycling for 6 days. For all groups, treatments were performed 2x/day for 1 minute, except for groups 3 and 6, which after treatment with 1100F and 1100F/TMP, MI was applied for 3 minutes. Data were submitted to ANOVA (one-way), followed by Student-Newman-Keuls test ($p < 0.001$).
Results 1100F and 1100F/TMP + MI groups presented similar values , as did MI and 1100F + MI. The 1100F/TMP group remineralized the enamel surface by ~ 41% and 111.5% over 1100F and MI ($p < 0.001$).
Conclusions It was concluded that the combination of treatments with 1100F/TMP + MI did not promote an additional effect on remineralization of initial lesions of caries, but its isolated use significantly increased %SHR.

Fluoride Content of Black-Tea Commercialized in Chile and the U.S.

C. E. Fernández[1], A. Tailor[2], J. Solanki[2], J. L. Le[2], H. T. Ho[2], H. Shen[2], T. Y. Bae[2]
[1]Universidad de Talca, [2]Midwestern University

Objectives Tea has become a popular drink in western diets, and part of the regular diet of most Chileans. Black tea has been shown as a natural source of fluoride (F), but with variable fluoride content. Here, we assessed the actual fluoride concentration found in tea infusions prepared from black teas commercialized in Chile and in the U.S.
Methods Commercialized black teas were acquired from fifteen different grocery-stores and coffee-shops in the Chicagoland area (n=149) and in a major grocery-store in Chile (n=12). Tea infusions were prepared by adding 1 tea-bag or 2.0±0.05 g in 200 mL of boiled deionized-water for 5 min. Chilean tea samples were prepared in triplicate. All individual samples were analyzed in duplicate. Fluoride was determined by using a calibrated ion-specific electrode and expressed as ppm F (μg F/mL). Fluoride values (mean ± SD) were compared to the optimal level of fluoride in drinking water. Additionally, 4 samples (containing 0.7-1.6-3.2-6.5 μg/mL) were prepared in triplicate with fluoridated tap-water.
Results Black tea commercialized in the U.S. (2.56±1.57 μg/mL [mean±SD]; min.0- max.8.95) and in Chile (3.567±1.757 μg/mL [mean±SD]; min.0.78- max.6.03) exhibited a large variation in fluoride concentration. Samples prepared with fluoridated tap-water (0.7 μg/mL) increased fluoride-content by 0.7 μg/mL regardless of tea F-concentration released and measured in deionized-water.
Conclusions Our data indicated that most of the black tea samples acquired in Chile and the U.S. are rich in fluoride, but with variable F concentrations among commercialized brands. The use of fluoridated tap water in preparing the tea has an additive effect to the F released from the tea.

Effect of Glass Ionomers Cements in the Cariogenicity of a *S. mutans* Biofilm

T. C. Azócar, A. Bergez, C. Bustos-Moraga, D. A. Bravo-Cavicchioli
University of Talca

Objectives The aim of this study was to analyze the effect of glass ionomer cements on the cariogenicity of a *S. mutans* biofilm (bacteria viability and acidogenicity) submitted to sucrose-induced cariogenic challenges.
Methods UA159 *S. mutans* were cultured for 4 days over 2mm x 4 mm circular disks (n = 18) made from 3 different materials: (i) Cavity lining resin-modified Glass Ionomer cement (GC Fuji Lining), (ii) high density restorative Glass Ionomer cement (GC Fuji 9) or, (iii) restorative resin-modified Glass Ionomer cement (GC Fuji 2). Disks were exposed to ultrafiltered saliva to simulate formation of acquired pellicle. All samples were exposed to a 10% sucrose solution 3 times a day. On the fourth day, biofilm was extracted to estimate the colony forming units (CFU) as indicator of bacteria viability. The pH of the culture media in different times was assessed as indicator of the acidogenicity of the biofilm. Data was compared by using a Kruskal-Wallis test ($p<0.05$).
Results Statistically significant differences were found for acidogenicity of media related to cements; resin-modified cements had significantly less acidogenicity at 72 hours ($p=0.016$). No statistically significant differences were observed between the cements when viable microorganisms were compared ($p=0.1314$).
Conclusions Despite the limitations of this experimental study, we can conclude that the Glass Ionomer and resin-modified Glass Ionomer cements tested had a similar effect on bacteria viability and in the acidogenicity of a *S. mutans* biofilm.

Morphological evaluation of topography of laser-machined surface-modified Ti-cp implants

A. Piquera Santos[1], H. Hadad[1], L. K. Jesus[1], T. Pereira Queiroz[2], A. Carlos Guastaldi[3], F. Ávila Souza[1]
[1]São Paulo State University (UNESP), School of Dentistry, Araçatuba, Brazil., [2]University of Araraquara-UNIARA, Araraquara, State of São Paulo, Brazil., [3]Paulista State University "Júlio de Mesquita Filho" - Unesp, Institute of Chemistry of Araraquara, Araraquara, State of São Paulo, Brazil.

Objectives Modifications in the morphology, chemical, physical-chemical properties of the implant surface and its influence on the osseointegration process have been the goal of many studies over the last years. The aim of this study was to characterize osseointegratable implants (Ti-cp) with machined surface (MS), laser modified surface (LS) and laser modified surface followed by deposition of sodium silicate (SS).

Methods For this purpose, topographic characterization was performed by scanning electron microscopy, SEM-EDS dispersive energy spectrometry. Mean roughness, cross-sectional roughness, contact angle, X-ray diffraction (XRD) and laser confocal optical profilometry of the three surfaces were also obtained. The data obtained by the roughness analysis were taken to the analysis of variance and the Tukey t test.
Results The SEM of Machined Surface (MS) showed smooth surface, contaminated with machining residues, while Laser modified surface (LS) and Silicate Surface (SS) produced rough surfaces with a more regular and homogeneous morphological pattern. The EDS analysis did not reveal any contamination of the analyzed surfaces, and showed Ti peaks for Machined Surface (MS) and Ti and oxygen for Laser modified Surface (LS) and Silicate Surface (SS). The average of values rugosity of Laser modified Surface and Silicate Surface were statistically higher (p five percent) when compared to Machined Surface. The numbers obtained in cross section roughness analysis were 21,76 micrometers and 28,75 micrometers respectively for Laser Surface and Silicate Surface (SS). The contact angle of Laser modified Surface (LS) and Silicate Surface (SS) was 0, allowing high wettability. The XRD of Machined Surface (MS) showed only Ti peaks, while Laser modified Surface (LS) and Silicate Surface (SS) showed the presence of oxides and nitrides. In Silicate Surface (SS) implants the XRD also showed the presence of sodium silicate.
Conclusions In view of the results obtained, it was concluded that the texturiations performed in the Laser modified Surface (LS) and Silicate Surface (SS) implants promoted important modifications in the topography and physical-chemical properties of the analyzed surfaces.

Prevalence and quality of root canal treatment in a Chilean subpopulation
A. Dezerega[1], M. Becker[2], M. Garrido[3], A. Briner[4], D. Jara[1], M. Hernandez[5]
[1]Universidad de los Andes, [2]Cecosf Los Libertadores, [3]Facultad de Odontología, Universidad de Chile, [4]Facultad de Odontología, Universidad de Chile, [5]Facultad de Odonología, Universidad de Chile

Objectives Dental caries is a highly prevalent disease, affecting approximately 95% of the Chilean population. Among its consequences, pulpal and periapical pathologies ultimately will require Root Canal Treatment (RCT) to maintain the tooth function. The technical quality of RCT may impact the tooth outcome and survival. To date, the prevalence of RCT in Chile in unknown. The aim of this study was to determine the prevalence of RCT and the technical quality of root canal fillings (RCF) in a Chilean sub-population.
Methods In this observational cross-sectional study, total periapical radiographs of 1000 patients (582 females, 418 males) aged from 18 to 95 ages, attending to IMAX imagenology center during 2016 were examined to identify the presence of RCT teeth. The technical quality of RCF was also evaluated according to Tavares criteria by two calibrated endodontists. Statistical analysis was performed with Stata V12 software.
Results 72% of the patients had at least one RCT, within a range from 1 to 23. From the 26216 evaluated teeth, 11% had RCT. No gender-differences were observed when considering relative frequencies. Posterior-superior teeth had the highest prevalence of RCT; meanwhile the antero-inferior had de lowest. Non-RCT teeth showed a proportional drop off as the patients age increased. The quality of RCF was adequate in 55.2% of anterior teeth, 49.7% in premolars and 37.6% in molars.
Conclusions The present study found a high prevalence of RCT teeth. The older the patients, the higher the frequency of RCT. The technical quality of approximately half of RCF was adequate. The more difficult the RCT, the lower quality of RCF.

Evaluation of Experimental Intracanal Medication Pastes Based on Glass-Ceramic Materials
J. R. Amadeu[1], J. de Araújo Lopes[1], F. Benetti[1,2], G. Rezende[1], M. Trevelin Souza[3], R. Jacinto[1], E. Zanotto[3], L. T. Cintra[1]
[1]São Paulo State University (UNESP), [2]Federal University of Minas Gerais (UFMG), [3]Federal University of São Carlos (UFSCar)

Objectives Studies have shown that Biosilicate-two phase (BS-2P) and F18 glass-ceramic materials release ions responsible for inducing osteogenesis. We evaluated experimental pastes prepared from these materials for biocompatibility and antimicrobial activity. Paste of calcium hydroxide ($Ca(OH)_2$) was used for comparison.
Methods The pastes were prepared by mixing the powder with distilled water (ratio 2:1) and inserted in polyethylene tubes that were implanted in 16 rats. Empty tubes were used as controls. After 7 and 30 days (n = 8), the rats were euthanized for haematoxylin-eosin analysis. The analysis of direct contact with planktonic cells of *E. faecalis* was performed to determine the antimicrobial activity. Statistical tests were performed ($p < 0.05$).

Results At seven days from the implantation, the groups had a moderate inflammation and thick fibrous capsule; at 30 days, the groups had and mild inflammation and the fibrous capsule was thin; there was no significant difference among the groups in both periods of analysis ($p > 0.05$). Regarding antimicrobial activity, all pastes reduced the total CFU/mL^{-1} number of *E. faecalis*; however, the reduction was significant when comparing BS-2P and $Ca(OH)_2$ groups to the control ($p < 0.05$).
Conclusions Experimental pastes based on BS-2P and F18 glass-ceramic materials are biocompatible compared to $Ca(OH)_2$; however, only the BS-2P paste demonstrated antimicrobial activity compared to $Ca(OH)_2$.

Enamel Evaluation After Removal Of Orthodontic Adhesive With Polymer Bur
L. P. Nunes, M. K. Augusto, M. F. Feres, M. G. Roscoe
Guarulhos University

Objectives This in vitro study aimed to test a polymer bur designed to selectively remove carious dentin on the efficacy of resinous remnant removal after bracket debonding.
Methods The crowns of 28 bovine incisors were embedded in acrylic blocks, and the buccal surfaces were analyzed by a profilometer to initial roughness measurement (Ra-T1). The brackets were bonded with a light-cured resin and debonded with a debonding plier. The samples were randomly divided into four groups, according to the bur used (n = 7): A- Tungsten carbide; B- Fiberglass; C- Polymer; D- Polymer associated with 75% ethanol pretreatment. The second roughness measurements were made after resin removal (Ra-T2). The time for removal procedures was also recorded. The third measurements were made after polishing (Ra-T3). Scanning Electronic Microscopy (SEM) was performed in two samples of each experimental group: one after resin removal, and the other after polishing. Results of roughness and time measurements were statistically analyzed by analysis of variance with post-hoc Bonferroni.
Results Tungsten carbide and fiberglass burs provided final surface roughness statistically similar to the baseline ($P > .05$). Polymer burs, associated or not to ethanol, provided surface roughness statistically significantly higher when compared to Ra-T1, even after polishing ($P < .05$).
Conclusions Polymer burs were more time consuming than tungsten carbide and fiberglass burs. Still, regardless of the system of choice, the polishing step must be considered essential after all resin has been removed, since it creates smoother surfaces regardless the burs used for resin removal.

"Chicha Morada" staining during dental bleaching in composite resin restorations.
E. D. Acuña[2,1], L. Delgado Cotrina[1], L. Tay Chu Jon[1]
[1]Universidad Peruana Cayetano Heredia, [2]Universidad César Vallejo

Objectives Evaluate the staining susceptibility during dental bleaching of one bleached composite resin after the exposure to three different beverages: a peruvian purple corn based beverage (chicha morada), green tea and distilled water.
Methods Thirty disk-shaped specimens of one nanofill composite resin (Filtek Z350 XT, 3M ESPE, USA) were prepared. The specimens were divided into six groups (n=5): purple corn (P), purple corn + bleaching (PB), green tea (T), green tea + bleaching (TB), distilled water (W), and distilled water + bleaching (WB). In bleached groups, two bleaching sessions of two 15 minutes applications each with 35% hydrogen peroxide (HP Maxx, FGM, Brazil) were performed following the manufacturer instructions. Following bleaching, specimens were exposed to each liquid thirty minutes daily. Color was measured with a digital spectrophotometer (EasyShade Advance, VITA Zahnfabrik, Germany). For statistical analysis, color measurement differences between the obtained results were used: during bleaching, after bleaching, and during + after bleaching. Two-way ANOVA was used to compare the color change (ΔE) in the resin composite specimens of all groups.
Results All evaluated beverages decreased the ΔE of the dental composite resin.The exposure to purple corn caused major statistically significant color differences when compared to green tea and distilled water.
Conclusions All the evaluated beverages produced color CHANGES in the composite resin regardless of the bleaching procedure. However, purple corn was the only beverage that caused a perceptible color change ($\Delta E>3.3$).

L-PRF As An Adjuvant To Scaling And Root Planing.

N. Jardel
Universidad de los Andes

Objectives To evaluate the use of *Leukocyte -Platelet Rich Fibrin (*L-PRF) as an adjuvant to conventional non-surgical periodontal treatment (scaling and root planing).
Methods A split-mouth clinical trial was conducted in patientes with periodontitis. Both quadrants randomly received scaling and root planing (SRP) + L-PRF or SRP + irrigation with physiological saline. Periodontal clinical parameters, sensitivity and values of Porphyromonas gingivalis were evaluated.
Results Scaling and root planing + L-PRF significantly decreased dental sensitivity after one week (p=0.0036) and 6 weeks (p=0.0109) of treatment, compared with the control group. Although the clinical and microbiological parameters did not show statistical significant differences, there was a tendency towards reduction and improvement in all of them.
Conclusions The use of L-PRF as an adjuvant to conventional non-surgical periodontal therapy had clinical benefits by reducing post-operative sensitivity in patients with chronic periodontitis.

Anatomical Localizacion of Mental Foramen Using Cone-Beam Computed Tomography

R. Jara Calderon, S. Andrade, S. Hernández, C. Sanhueza
Universidad Austral de Chile

Objectives Confirmation of the foramen mental (FM) location is essential to avoid nerve injuries during dental procedures. The distance from the FM to the adjacent tooth can be assessed by cone beam computed tomography (CBCT) safely and accurately. The objetive was to determine the average ditance between the upper cortex of the FM and the nearest dental apex, in a population Valdivia, Chile.
Methods An observational study was perfomed that measured the distance in millimeters (mm) from FM to the nearest dental apex of 99 CBCT examinatios that met the inclusion criteria (patients over 18 years of age, complete mandibular dentition excluding third molar, complete root formation) and exclusion criteria (Bone pathology in the mental region, mandibular fracture, history of periapiapical surgery, presence of foramines, non-diagnostic CBCT, patients undergoing orthodontic treatment. The measurement was made in a cut that intercepts the FM and the nearest dental apex.
Results A total 99 cases where evaluated (72 women/ 27 men), with an average age 34.7 years and a range of 18-73 years. The FM was located at 3.22mm from the nearest dental apex, the minimum distance found was 0.81mm and the maximum 6.99mm and 47.93% of the distance are less than 3mm from the upper cortex of the FM to the nearest dental apex. It is related to the second premolar in 79% of cases and first premolar in 17%
Conclusions The FM is located close to the premolar area, its location can very considerably in relation to the apices of these teeth. This study confirms the importance of being cautious during endodontic and / or surgical treatments to prevent nerve injuries in relation to this anatomical structure

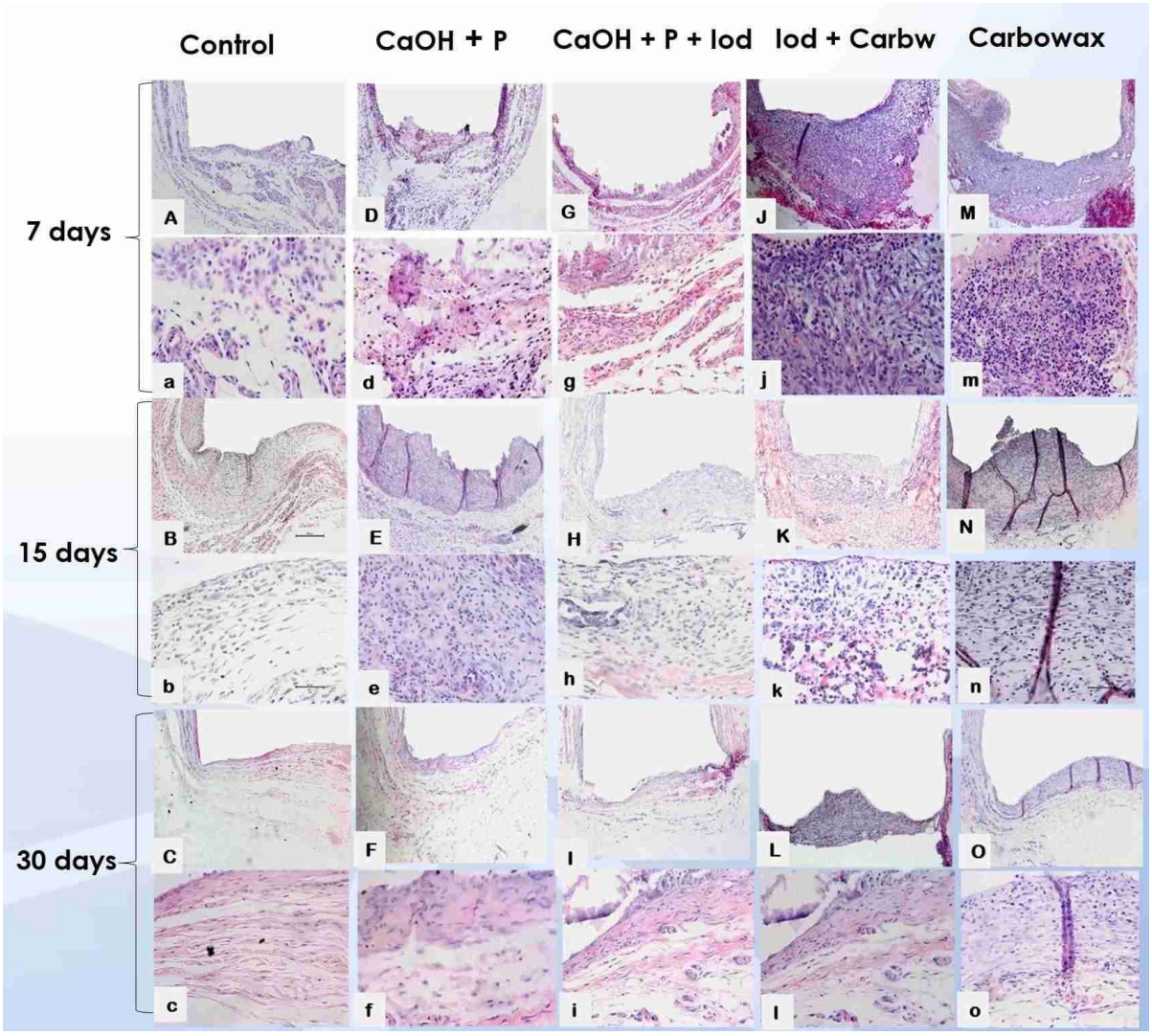
Biocompatibility and Biomineralization Assessment of Iodoform and Calcium Hydroxide Pastes

D. M. Tavares[1], J. L. Sarmiento[1], C. Bueno[2], J. Q. Trizzi[3], A. V. Vasques[1], M. T. Cury[4], H. A. Banci[5], P. H. Chaves de Oliveira[1], R. Castilho Jacinto[1], G. Sivieri-Araújo[1], L. T. Cintra[6], E. Dezan-Junior[7]
[1]São Paulo State University (UNESP), [2]UNESP, [3] Univ Estadual Paulista, [4]UNESP, [5]São Paulo State University (Unesp), School of Dentistry, Araçatuba, [6]UNESP-Univ Estadual Paulista, [7]UNESP

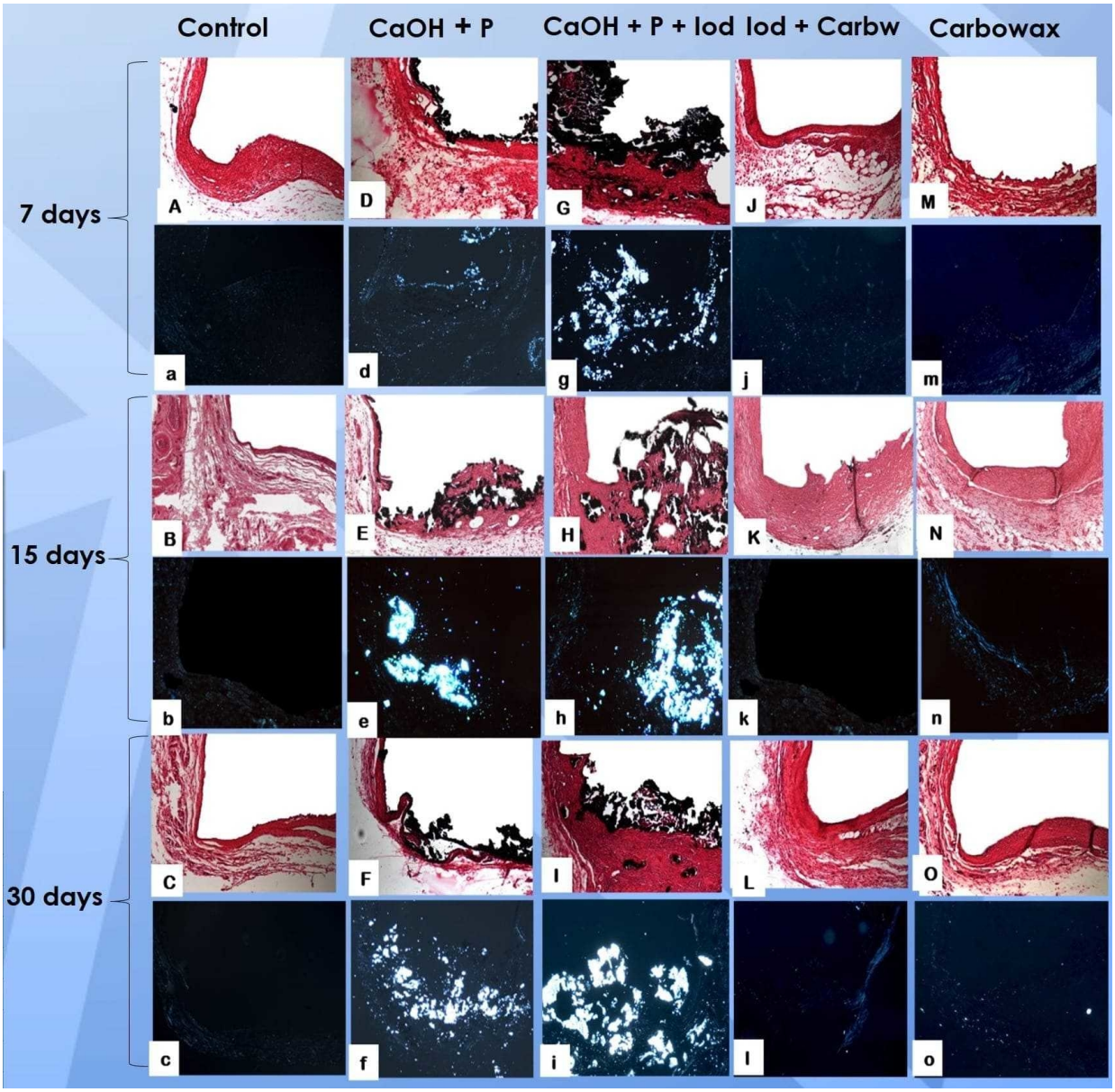
Objectives The aim of this study was to evaluate, *in vivo,* the inflammatory response and the biomineralization capacity of iodoform and calcium hydroxide pastes in subcutaneous tissue of rats. Eighteen *Wistar* rats (n=6) received implanted polyethylene tubes filled with the following materials: calcium hydroxide + propylene glycol; calcium hydroxide + propylene glycol + iodoform; iodoform + Carbowax; and Carbowax.
Methods Empty tubes were used as control. After 7, 15 and 30 days, the animals were euthanized and the polyethylene tubes were removed with the surrounding tissues. Inflammatory infiltrate and thickness of the fibrous capsule were histologically evaluated via hematoxylin-eosin (HE) staining, attributing the following scores: 0 (few inflammatory cells); 1 (less than 25 cells); 2 (between 25 and 125 cells); and 3 (125 or more inflammatory cells). The fibrous capsule was classified as thin (<150μm) or thick (>150μm). Mineralization was assessed by Von Kossa (VK) staining and under polarized light (PL) as positive or negative. After tabulated, data were analyzed via Kruskal-Wallis and Dunn's test with a significance level set at 5%.

Results After 7 days, all groups showed similarity to control with inflammatory score 2, except Carbowax, which showed score 3. All groups showed initial thick fibrous capsule, similar to control. After 15 days all groups, except control, showed a decrease in the inflammatory infiltrate and fibrous capsule thickness. After 30 days, all groups presented score 1 and thin fibrous capsule. Regarding biomineralization, the groups containing calcium hydroxide were positive for VK and PL in all experimental periods, in contrast to the other groups, which showed no signs of mineralization in any period, similar to control.

Conclusions At the end of the experiment, all materials showed biocompatibility but only the groups containing calcium hydroxide induced biomineralization.



Histologicalanalysis(HE). Fibrouscapsule A-O (100x). Inflammatoryinfiltratea-o (400x).



Biomineralization induction analysis. Coloring Von Kossa A-O. Polarized light a-o.

Inflammatory infiltrate and fibrous capsule thickness

(N=6)	Score 0 1 2 3 4				Median*	Capsule Thick Slim	
7 *days*							
Control	0	1	4	1	2[a]	6	0
$Ca(OH)_2$+P	0	1	4	1	2[a]	6	0
$Ca(OH)_2$+P+Iodo	0	0	5	1	2[a]	6	0
Iodo+Carbow	0	0	4	2	2[a]	6	0
Carbow	0	0	2	4	3[b]	6	0
15 *days*							
Control	0	2	3	1	2[a]	6	0
$Ca(OH)_2$+P	0	1	5	0	2[a]	4	2
$Ca(OH)_2$+P+Iodo	0	1	4	1	2[a]	3	3
Iodo+Carbow	0	0	4	2	2[a]	5	1
Carbow	0	0	4	2	2[a]	3	3
30 *days*							
Control	1	5	0	0	1[a]	0	6
$Ca(OH)_2$+P	0	4	2	0	1[a]	0	6
$Ca(OH)_2$+P+Iodo	0	3	3	0	1,5[a]	0	6
Iodo+Carbow	0	4	2	0	1[a]	0	6
Carbow	0	4	2	0	1[a]	0	6

Diagnostic precision of panoramic radiography for canine impaction: systematic review

V. P. Galdames[1], S. Uribe[2], C. Curriel[1], M. Arriagada[1]
[1]Universidad Autónoma de Chile, [2]Universidad Austral de Chile

Objectives Early detection of impaction of permanent maxillary canines (PMC), as well as associated complications, is important for pediatric dentistry and orthodontics. In addition, panoramic radiography is a quick, relatively inexpensive, low-dose examination that is used to control tooth development. The aim of this systematic review is to evaluate the diagnostic accuracy of panoramic radiography compared to cone-beam CT (CBCT as gold standard for the detection of PMC, as well as the detection of radicular reabsorption of the permanent lateral incisor, placement of the permanent maxillary canine in the vestibular sense, palatine and the relationship of contact with the permanent lateral incisor.
Methods We searched for diagnostic accuracy articles published between years 1996 and 2016 that compared the detection of stated radiographic signs using panoramic radiography and CBCT as an index test in the PubMed, ProQuest and WOS[1] databases. The methodological quality of the reports was evaluated using the STARD guideline. The quantitative synthesis was performed by a diagnostic meta-analysis using diagnostic odds-ratio (DOR). The statistical significance was p=0.05.

Results We found 213 studies. After removing the duplicates, there were 148 studies, of which 3 had the required methodological quality and reported the necessary information to be included in the meta-analysis. The diagnostic precision for the reported signs were: root resorption of the lateral incisor (DOR: 0.522, p=0.334); vestibular location (DOR: 0.547, p <0.001), arch line (DOR: 0.765, p=0.156); palatine location (DOR: 1.073, p=0.474), and contact (DOR: 0.650, p=0.320).
Conclusions Panoramic radiography detects some signs of impaction of the maxillary permanent canine: the presence of root resorption of the lateral permanent incisor, the palatal location of the maxillary canine and contact, while it does not detect the location in the vestibule-palatine direction, or on the arch line.

Reliability Of Demirjian&Goldstein-Method For Dental Age Assessment Of Chilean Population

C. Curriel Dossow[1], S. Uribe[2], V. Galdames[1], r. Mast Tormo[1]
[1]Universidad Autonoma de Chile , [2]Universityersidad Austral de Chile

Objectives To assess the reliability of the Demirjian&Goldstein method in the assessment of dental age in panoramic radiographs of Chilean children and adolescents.
Methods A non-probabilistic sample of 182 digital panoramic radiographs of Chilean children and adolescents ranging in age from 3 to 18 years were used to determine their appropriateness to a Chilean population. The stages of mineralization of the seven left mandibular permanent teeth were assessed using the eight stages described by Demirjian&Goldstein by one calibrated evaluator. Intra-observer reliability was evaluated using intraclass correlation coefficient method on data from re-scoring 30 radiographs. The mean age and standard deviations (SD) were calculated separately for males and females of preschool (2-5 years old), child (6-12), adolescent (13-18) and all child (0-18). The reliability was measured with the intraclass correlation coefficient with 95% confidence interval between estimated and real age. Analyses were performed by age subgroups using the student T-test with a significance level of 0.05.
Results The mean estimated age (SD) was 11.72(3,88) and real was 10.83(4.23). The ICC was 0.875 (95%-Confidence Interval 0.836, 0.905). Difference was found for children less than 6 years old and over 12 years old.
Conclusions Demirjian's method is reliable for determining the dental age on digital panoramic X-rays of children in Chile, particularly between the ages of 6 and 12.

Oral Appliances for Obstructive Sleep Apnoea: An Overview of Systematic Reviews

V. Wielandt[1], F. Verdugo[2,3], S. Palacios[4]
[1]Universidad de los Andes, [2]Pontificia Universidad Catolica, [3]Epistemonikos Foundation, [4]Clinica Universidad de los Andes

Objectives To identify and summarize the evidence of the systematic reviews (SRs) comparing treatments based on oral appliances (OA) and continuous positive airway pressure (CPAP) in Obstructive Sleep Apnoea (OSA)
Methods We performed a search in Epistemonikos, the largest database of SRs in health, which is maintained by screening in multiple information sources, including Pubmed/Medline, Embase, Cochrane, among others. SRs comparing the use of OA and CPAP in patients with OSA were included. We did not impose any restriction on language, country or published status. Selection of systematic reviews, data extraction and quality assessment were undertaken in duplicate. Review quality was assessed using the AMSTAR tool.
Results Of 72 SRs identified, 30 were included. The number of randomized clinical trials (RCT) in the different SRs ranged from 1 to 17. In total, 21 differents RCT were identified and none of the SRs included all relevant RCTs.18% of SRs were high and 36% were low quality. Following outcomes were reported in SRs: daytime sleepiness (17), apnoea hypopnoea index (15), quality of life (7), cognitive (6), blood pressure (5), side effects (5), patient preferences (4) and others. The quality of the evidence for specific comparisons ranged from low to moderate. Limitations in the evidence included risk of bias in the primary studies, inconsistency between the studies, and imprecision in effect estimates.
Conclusions There is a large amount of SRs about this topic, but high quality SRs are needed. New RCTs are required to evaluate the safety and preferences of patients regarding this intervention. CPAP appears to be more effective in in reducing daytime sleepiness and improving the quality of sleep of patients with OSA. There is evidence of moderate methodological quality that indicates that MAD is a good treatment option for patients in whom CPAP is not well tolerated or cannot be indicated.

Crevicular Inflammatory Profile of Psoriatic and Healthy subjects with/without Periodontitis

D. Cavagnola[1], D. Carvajal[4], J. Fernández[4], F. Valenzuela[2], C. Jimenez[1], M. Hernandez[2], V. Díaz[1], A. Fernandez[1,3]
[1]Faculty of Dentistry, Universidad Andrés Bello, [2]Department of Dermatology, Faculty of Dentistry, Universidad de Chile, [3]Laboratory of Periodontal Biology, Faculty of Dentistry, Universidad de Chile, [4]Unit of Dermatology, Hospital San José

Objectives To compare the levels of IL-17A, IL-22, IL-23, S100A7 and S100A8 in the crevicular gingival fluid (CGF) of psoriatic patients and healthy controls with and without periodontitis and their relations to psoriasis severity
Methods A cross-sectional study was designed with >18-year-old psoriatic patients recruited by convenience from the Dermatology Department of Hospital San José, Santiago. Matching systemically healthy controls were enlisted from the Dental Clinic of Universidad Andrés Bello, Republica. Patients with either autoimmune/inflammatory comorbidities or those who had received periodontal, ATB, NSAID or corticosteroid treatment in the last 3 months were excluded. Intraoral and periodontal examinations were carried and patients were categorized into 4 groups according to Page & Eke's classification for periodontal disease: (H)Systemically healthy with no/mild periodontitis (N=17), (HP)Systemically healthy with moderate/severe periodontitis (N=22), (P)Psoriatic with no/mild periodontitis (N=13) and (PP)Psoriatic with moderate/severe periodontitis (N=30). 30-second GCF samples were obtained with paper strips from the deepest periodontal pocket in each quadrant. Levels of IL-17, IL-22, IL-23, S100A7 and S100A8 were quantified by ELISA and MULTIPLEX analysis.
Results A two-fold increase in the GCF levels of S100A8 was measured in psoriatic patients versus controls (2218.85+1187.82 and 2171.17+1141.03 vs. 794.58+461.36 and 1110.44+797.91 in P and PP vs. H and HP respectively, $P<0.05$). S100A8 correlated positively with psoriasis severity in psoriatic patients with no/mild periodontitis ($P<0.05$). No significant intergroup differences in the concentrations of IL-17A, IL22, IL, IL-23 and S100A7 were observed ($P>0.05$).
Conclusions GCF levels of S100A8 could be a prospective tool for psoriasis diagnosis and as well as a novel biomarker for psoriasis severity in adult patients. These immune molecules did not seem to reflect the link between periodontitis and psoriasis

Periodontal Status in Individuals with Rosacea: Pilot Study

J. Salgado[1], F. Galinovic[1], C. Mendibure[1], C. Arcos[1], C. Jimenez[1], M. Marshall[2]
[1]Universidad Andrés Bello, [2]Universidad Andrés Bello

Objectives Compare periodontal status and hygiene habits of individuals with rosacea and healthy controls.
Methods An observational pilot study was designed. The selection of subjects > 18 years old was done by convenience. Patients with autoimmune or inflammatory disease that had received in last three months periodontal therapy, non-steroidal anti inflammatory drugs or antibiotics were excluded. The dermatological diagnosis of rosacea was made via telemedicine by an expert dermatologist. All control patients where recruited from Andrés Bello University Dental Clinic of Santiago, Chile, where both rosacea patients and healthy controls were examined by a periodontal specialist. The statistical analysis was performed with Prism6 software.
Results 26 individuals were included, of which 84.61% were women. Both the rosacea and control group has 13 patients each. The mean age was 31.69±10.63 and 34.77±9.6 years old, respectively ($p<0,05$). The probing depth average, clinical attachment level and bleeding on probing in rosacea patients were 1.896±0.3mm, 1.58±0.65mm and 6.18%; and in the healthy controls were 2.12±0.52mm, 1.54±0.82mm and 10.01% ($p<0,05$). There were no significant differences in hygiene habits.
Conclusions Patients with rosacea had better periodontal parameters than healthy controls. Rosacea could be a protective factor for periodontal disease; however, more studies are needed to confirm it.

Synthesis Of Novel Chalcone Derivatives With Potential Oral Antibacterial Properties

F. c. Arcos Baeriswyl[1], M. Zarraga[2], B. Benso[1], S. Aguayo[1]
[1]Pontificia Universidad Católica de Chile, [2]Universidad de Concepción

Objectives Currently, due to an alarming increase in antimicrobial resistance, many efforts are being pursued to find novel antibacterial compounds.
Methods Thus we synthesized a set of naturally occurring compounds, chalcones (1,3-diohenyl-2-propene-1-one), with the aim of identifying potential antibacterial effects against Streptococcus mutans UA159. We delineated pathways for the site-directed synthesis of 10 different chalcones with their corresponding NMR analysis. The oral strain S. mutans UA159 was cultured in BHI media and bacterial stock inoculums were set at McFarland scale 0.1-0.08. Experiments were carried out in a 96-well micro plate and subsequently analyzed quantitatively using automated plate-reader absorbance measurements and a resazurin viability assay. Initially, 10 structurally different chalcones were evaluated, by treating S. mutans with serial dilution concentrations (1 uM-0.0078 uM) looking for a possible antibiotic response. In a second experiment, chalcone 12 was analyzed separately and a time-kill kinetics assay was used to determine the drug time-exposure effect. The positive control for all experiments was chlorhexidine 0.12%. Finally, we obtained 3-day mature biofilms using glucose as adjuvant to observe potential biofilm-inhibiting pharmacological effects. For all experiments, nonparametric statistical analysis was used considering gaussian pattern of data distribution and $p<0.05$
Results It was observed for the first experiment that chalcone 12 had a minimum inhibitory activity (MIC; CLSI) at 250 nM concentrations. In the second experiment, a bacteriostatic activity was observed for this new compound associated with a slower growing profile when compared to the vehicle group during the first three hours. The last experiment demonstrated no differences in biofilm formation between chalcone 12 and the non-treated groups, which may be explained as an insufficient drug exposure protocol.
Conclusions Our findings demonstrated that chalcone 12 has promising bacteriostatic effects working in very low concentration (nanomolar range) against S. mutans.

F-varnish containing TMP reduces caries progression in the permanent dentition

C. SAMPAIO[1], A. C. Delbem[1], M. M. Manarelli[1], D. R. Monteiro[1,2], L. C. báez-quintero[1], H. M. Honório[3], J. P. Pessan[1]
[1]São Paulo State University (UNESP), Araçatuba, SP, Brazil, [2]University of Western São Paulo (UNOESTE),
[3]University of São Paulo

Objectives This study assessed the clinical effectiveness of a fluoride varnish supplemented with sodium trimetaphosphate (TMP) on the development of caries lesions in the permanent dentition, in a randomized, double-blinded and controlled clinical trial.
Methods Subjects (n=570, 11-15 years old) attending public schools in the city of Boa Vista, northern region of Brazil, were randomly assigned into 3 treatment groups, according to the varnishes: 5% NaF (F-varnish), 5% NaF + 5% TMP (F/TMP-varnish) and placebo (PLA; no fluoride or TMP). Randomization considered age, gender and baseline DMFS (decayed, missing, or filled surfaces). Fluoride dentifrices (1100 ppm F, as NaF) and toothbrushes were provided to all volunteers every three months, along with instructions regarding brushing frequency (twice/day) and amount of dentifrice (smear) used during toothbrushing. Volunteers were examined at schools by a single calibrated dentist, at the beginning of the study and every 3 months until 24 months (totaling 9 examinations), by visual inspection using a plane mirror and a ballpoint probe. Varnishes were applied on the same occasions. Data were submitted to two-way, repeated-measures ANOVA, Tukey's HSD test and multivariate linear regression analysis (p<0.05)
Results Significant increases in mean DMFS were observed at 9 and 15 months follow-up examinations, respectively for PLA and F-varnish; no significant increase was observed in F/TMP-varnish group in any time evaluated. At the end of the follow-up period (24 months), the lowest DMFS increment (final – initial DMFS) was observed in F/TMP-varnish (0.03), followed by F-varnish (0.15) and PLA (0.31), with significant difference between PLA and F-varnish. The variables "school", "type of varnish" and "initial DMFS" significantly affected the results.
Conclusions It is possible to conclude that the anticaries effect of F/TMP-varnish is higher than the effect observed to F-varnish in caries lesions in the permanent dentition.

Characterization of human T helper-like regulatory T cells and chemokine expression in oral squamous cell carcinoma.

M. Fraga Figueroa[1], M. Yañez[2], M. Sherman[3], A. Flores[1], F. Zuñiga[1], E. Nova-Lamperti[1]
[1]Universidad de Concepción, [2]Hospital Las Higueras, [3]Hospital Clínico Regional Dr. Guillermo Grant Benavent

Objectives In this study, we evaluated the phenotype of tissue resident Th-like Tregs and the expression of CCL1, CCL17, CCL18 and CCL22 in cancer tissues from patients with oral squamous cell carcinoma compared to healthy oral mucosa.
Methods We use flow cytometry to evaluate the phenotype of tissue resident Th-like Tregs. The expression of the chemokines was evaluated by immunohistochemistry of paraffin-embedded tissue sections and ELISA in secretome of tissues from patients with oral squamous cell carcinoma compared to healthy oral mucosa.
Results Our results demonstrated that patients with oral cancer exhibited higher percentages of Th2-like Tregs with high CCR8 expression. In addition, levels of CCL18 were increased in cancer samples in comparison with healthy mucosa.
Conclusions These results suggest that CCL18 may supports the migration of CCR8-expressing Th2-like Tregs to malignant areas in oral cancer.

Bilateral Symmetry of Caries in Primary Dentition of Chilean Children

M. Troncoso[1], F. Moreno[1], J. Vargas[2], D. Ortuño[1,2]
[1]Dirección de Salud, El Bosque, [2]Escuela de Odontología, Pontificia Universidad Católica de Chile

Objectives Describe the presence of caries symmetry in primary dentition of Chilean children between 2 to 4 years old, receiving dental care in a community program.
Methods Data from 1232 children between 2 to 4 years old who are part of the "Sembrando Sonrisas" program from "El Bosque" in Santiago, Chile, were selected to form part of this study. The clinical information from each subject was obtained from the program's database. Pearson correlation coefficient and paired-sample t-test were calculated using SPSS 26.0 statistics software (Mac OS X). The ratio of bilateral caries was calculated in those children with one or more caries lesions.
Results The average age was 2,89 years (±0,82). In the sample, 598 (48,5%) were girls and 634 (51,5%) boys. Girls had 0,91(±2,16) dft index and boys 1,24 (±0,10), difference which showed to be statistically significant (p-value: 0,014).
Pearson's correlation ranged from 0.379 (upper canines) to 0.716 (lower first molars) in relation to the dft index according to the dentition side (left or right). The difference in the dft values of primary teeth on the left versus right side was not significant (p-value> 0.05) for all deciduous teeth set.
The proportion of teeth with bilateral caries lesions among individuals with one or more lesions ranged from 22.2% (superior canines) to 79.7% (upper central incisors).
Conclusions These results suggest that dental caries in primary dentition show a degree of symmetry between caries lesions of the right and left side. Differences in the degree of symmetry were observed according to the deciduous teeth set. Nonetheless, it is needed to consider zero-inflated data in future analyses.

Identification of Bone Remodelling in Functionally-Loaded Craniofacial Surfaces

D. Valdés[1,2], N. Brachetta-Aporta[3], V. Toro - Ibacahe[1,2]
[1]University of Chile, [2]Max-Planck Institute of Evolutionary Anthropology, [3]National University of La Plata

Objectives The human face has been described to have anatomical areas that are highly stressed during mastication. These areas would likely undergo bone remodelling processes that lead to facial differences among adult individuals. The aim of this preliminar study was to explore the validity of this assumption by assessing the remodelling activity of bone surface using reflected-light based surface microscopy on resin casts, a method used in other disciplines but that has been largely overseen in dental sciences.

Methods Resin casts were built from silicone impressions of three skulls from current Chilean territory that differ in diet consistency and thus exerted different magnitudes of masticatory forces in life. Using reflected-light digital microscopy at 90x-100x magnification, the casts of the anterior face of the maxilla, mandible ramus and body, and mandibular fossa were divided in grids and based on the presence of collagen bundles and/or Howship's lacunae, their surface activity was classified as "resorption", "deposition" and "rest". Colour-coded maps were built to depict activity patterns for qualitative comparative analysis
Results In general, resorpion/deposition areas were consistent with areas where previous studies show the occurrence of high stress during mastication: nasal notch, mandibular body at the posterior teeth, posterior slope of the articular tubercle of the temporal bone. Among individuals, the individual that exerted larger masticatory forces shows the largest areas of bone resorption, suggesting higher remodelling activity.
Conclusions This is a preliminary study that shows promising results, aiming to include a larger number of individuals to study the process of bone plasticity in response to the functional environment. The technique proposed here could have an impact in fields like craniofacial research and forensic dentistry.

Predentin Degradation Promotes Biofilm Adhesion In Infected Root Canals.
J. A. Lucero, P. J. Rebolledo Vásquez, A. E. Oyarzún Droguett
Universidad Finis Terrae

Objectives The present study was designed to analyse the effect of predentin degradation on biofilm adhesion in infected root canals.
Methods 30 tooth roots with clinical and radiographic diagnosis of symptomatic or asymptomatic apical periodontitis and extracted by surgical reason were fixed in formaldehyde-ethanol-acetic acid for 48 hours, demineralized and processed for histological technique. Dewaxed 6 μm sections were incubated in an anti-chondroitin sulfate monoclonal antibody (clone CS-56, Sigma), for 12 hours at 4 ° C. The antigen-antibody reaction was detected using a biotin-streptavidin-peroxidase-diaminobenzidine technique.Sections were counterstained with Gram stain or eosin. Tissues were microscopically analized and photographed with a 3.3 RTV Micropublisher cooled digital camera. The images were saved as TIFF files. As control, premolars extracted by orthodontic purposes were studied.
Results Immunohistochemistry demonstrated that predentin layer and dentinal tubules were strongly stained in control specimens. In all experimental specimens, the predentin layer disappears from the root canal walls leaving mineralization front and calcospherites exposed to canal space. Gram stain shows bofilm adhesion on the irregular circumpulpar dentin surface. Grooves between calcospherites were observed colonized by biofilm islands. Many infected calcospherites were observed in the canal space.
Conclusions The endodontic biofilm adheres to the mineralization front and calcospheritic pattern following degradation of predentin. Our results highlight the importance of an adequate chemical-mechanical preparation for the disinfection of the root canals in clinical endodontics.

Cytotoxicity of universal adhesives and autophagy in Saos-2 Cells
B. S. Cruz[1], E. Fernandez[2], S. Buvinic[3], M. Gutierrez[1], N. Hernandez[1]
[1]University of Chile, [2]Universidad de Chile, [3]Universityersidad de Chile

Objectives Objective: This study aims to determine if universal dental adhesives have a cytotoxic effect in Saos-2 cells due to activation of the autophagic route.
Methods Saos-2 cells were stimulated with three different universal adhesives: Ambar universal (FGM), Single Bond universal (3M), Prime & Bond universal (Dentsply) at a concentration of 0.1% v/v. Culture medium with no adhesives or 10 mM Rapamycin was used as a negative or positive control, respectively. Levels of p62 and LC3I/LC3II were evaluated by immunoblot and the presence of autophagosomes was addressed by fluorescence microscopy after 2-6h with the stimulus. The cytotoxicity of the universal adhesives (24 h exposure) was evaluated by the MTT assay, in the presence or absence of the 3-MA autophagy inhibitor.

Results There was a decrease on the viability percentage for all the samples treated with universal adhesives, as follows: Ambar universal, 2% viability; Single bond universal, 56% viability; Prime & Bond universal, 1.9% viability. When treated with the autophagy inhibitor 3-MA the cell viability decreased even more, especially the ones treated with Single bond Universal (18.9% viability), which suggests that the autophagy is not a mechanism for cell death, but a way to improve cell survival reduced by dental adhesives. There was also an increase in the LC3II/I ratio, and a decrease in the p62 levels measured by immunoblot in the cells exposed to Ambar universal, which is compatible with autophagy events at 6h of exposure. Immunofluorescence imaging evaluation shows autophagosomes formation with the three adhesives after 6h.
Conclusions Universal dental adhesives evoke cytotoxicity of Saos-2 cells. Autophagy pathways are activated as a strategy for cell survival and adaptation.

Oxidative stress induces senescence and alters the cytoskeleton in fibroblasts
S. Lai, J. Espinoza, P. Smith
Pontificia Universityersidad Católica de Chile

Objectives Connective tissue cells of the periodontium are exposed to chronic or acute oxidative stress that may derive from inflammation. In the present study we have evaluated whether oxidative stress can induce senescence and alter important functions for tissue homeostasis in the gingival tissue.
Methods Human gingival fibroblasts (HGF) were obtained from 5 healthy young donors. HGF were exposed to hydrogen peroxide (600 mM) for 2 hours twice. Senescence was evaluated by measuring cell area, Ki67 staining, g-H2A.x phosphorylation and expression of SA-b gal. Cytoskeleton organization and function was evaluated through immunofluorescence for actin, vinculin and collagen gel contraction. Statistical analysis was performed by the student's t test.
Results Oxidative stress induced a significant reduction in cell proliferation, an increase in cell size and g-H2A.x phosphorylation and SA-b gal expression as indicators of DNA damage and cellular senescence. Oxidative stress also induced a reduction in actin stress fibers distribution and in focal adhesions. In addition, hydrogen peroxide treated cells manifested a deficiency in collagen gel contraction.
Conclusions The present study shows that acute oxidative induces senescence and alters the organization and function of the cellular cytoskeleton in HGF. This response may have detrimental effects in the regulation and homeostasis on gingival connective tissue cells.

Adhesion of Metal Brackets on Provisional Materials: In-Vitro Study.
D. Ledesma, L. Wang, R. Oyonarte, C. Sampaio, V. Rojas, M. Sáez
Universidad de los Andes

Objectives To evaluate the resistance to shear bond strength, (SBS) of metallic brackets bonded to acrylic resin of PMMA and BisGMa using three types of adhesives.
Methods 120 samples of PMMA resin (Duralay® (D)) and BisGMa (Protemp ™ 3 (P)) were manufactured. 12 groups were established (n = 20), according to provisional material, adhesive and thermocycling (TC). Each group had a sandblasted control that allowed to discard the mechanical effects in the results. Metal brackets were cemented using composite resin (Transbond®XT) (1), urethane methyl methacrylate (UMM-Triad®Gel) (2), or Cyanoacrylate (3). The immediate and subsequent SBS was measured. The Adhesive Remnant Index (ARI) was evaluated to determine the type of union failure. Statistical analysis: The Kruskal-Wallis test was performed to determine differences between groups, the Mann-Whitney test for intra-group paired comparisons and The Dunn post-hoc test ($P < 0.05$) to compare groups according to type of adhesive failure.
Results No differences in the SBS were observed between sandblasting and no surface treatment, except for the P3-TC group. According to the type of provisional, P3 had greater SBS than D3; P2 and P2 (control) to D2 and D2 (control), respectively. For the thermocycling treatment, P3-TC had lower SBS compared to P3. Regarding to adhesive: SBS of composite resin and Cyanoacrylate were significantly greater than UMM at 24 hours. Post-thermocycling, P1-TC was superior to P3-TC.
Conclusions There are differences in the in vitro SBS of cemented brackets over the provisional of BisGMA and PMMA, when using composite resin, UMM and Cyanoacrylate. SBS depends on the provisional material, the TC and sandblasting. Composite resin should be the adhesive of choice, UMM is not recommended.

Factors Associated to Apparition of Post-Exodontia Complications: a Systematic Review

L. Torres[1], W. Astudillo[1], V. Herrera[1], D. Catricura[1], A. Vasquez[1], N. Ferrer[2]
[1]Univeristy of Antofagasta, [2]Univeristy of Antofagasta

Objectives To analyze the factors associated with post-surgical complications of the simple exodontia.
Methods A systematic review was performed, considering the methodology of the Cochrane manual and PRISMA declaration. The search strategy used was the following: “Complication” and “Exodontia” as key concepts; Science Direct, Pubmed and Scopus as databases; searching without year restriction. The inclusion criteria were the following: retrospective studies that describe post-exodontia complications in humans. The exclusion criteria were the following: non-clinical studies, exodontia realized under general anesthesia and third molars extractions of high complexity
Results 1386 articles were found after the first search (algorithm). After title and abstract revision, 12 articles met the study objectives. After the full reading of these articles, 3 met the inclusion/exclusion criteria and were analyzed. The information collected from these three articles was as follows: 22.084 patients attended, 31.401 teeth extractions, 8.792 post-exodontia complications (27.9%). In descendent order, the most frequent complications were Trismus 12.87% (4.042), dry socket 8.45% (2.655), post-operative pain 2.81% (883), wound dehiscence 2.48% (779), surgical site infections 0.28% (88) and retained roots 0.06% (21), among others. All studies included the participation of undergraduate students. Two articles showed a statistical difference by chi-square test in the apparition of post-surgical complications comparing the professional dentist procedures with the student procedures (p-value <0.05); Similar results were observed among the undergraduate students from sixth, fourth and fifth year (p-value <0.05). Additionally, one study showed a statistical difference between the exodontia finished before and after thirty minutes (p-value <0.05).
Conclusions The higher incidence of post-exodontia complications is associated with the level of experience of the dental surgeon and a longer surgical time (greater than thirty minutes) of the surgical procedure.

"Prevalence of Carotid Artery Calcifications detected on panoramic radiographs"

C. López de Ayala Robertson, D. M. Cabezas Urrutia, V. Budini Jorquera
Universidad

Objectives Establish prevalence of carotid artery calcifications (CAC) detected on panoramic radiographs of patients treated at the dental radiology center of the Universidad Mayor, Temuco between 2014-2017.
Methods Cross-sectional design. The census type sample includes all panoramic radiographs of adult patients over 30 years old treated at the dental radiology center of the Universidad Mayor, Temuco between 2014 and 2017. Anonymized radiographs were collected from the database "Romexis" and age and sex data of each patient were recorded [1,2]
Results 500 radiographs were evaluated, CAC were found in 68 patients representing 13.6% of cases; 5.6% CACs were observed bilaterally, 2.8% on the right side and 5.2% on the left side. Otherwise, it was observed that 10.2% of patients that presented CAC were women, the most frequent location among them was bilateral and a 3.4% of patients were men where left unilateral location was more frecuent. The highest percentage of calcifications was found in the 50 to 70 years age range with 71.9% of cases.
Conclusions Atheromas located near the carotid bifurcation are common causes of stroke. That is the reason of the importance of the proper use and analysis of panoramic radiography in this scenario, taking into account that it is a minimally invasive and easy examination. [3,4,5,6]
The prevalence of CAC is considerable, especially in old age. Knowledge of this disease is required so professionals that request and those who daily report panoramic radiographs can properly refer patients for diagnostic confirmation by more specific tests.

Longitudinal Evaluation of Preventive Methods of Dental Caries in Molars.

A. G. LISBOA[1], I. D'Avanço[2], N. Abreu[2], H. C. Araujo[1], K. Takahashi[2]
[1]Faculdade de Odontologia de Araçatuba - UNESP, [2]Universidade do Oeste Paulista - UNOESTE

Objectives This study aimed to evaluate the longitudinally the evolution, stabilization or regression lesions of caries of pigmented grooves of first permanent molars, correlating with different preventive methods.

Methods Children (*n*=60 - aged 6 to 12 years old) attending from a public daycare center of the city of Presidente Prudente (SP, Brazil) diagnosed with pigmented grooves in first permanent molars were randomly assigned into 4 groups, according to the interventions: Group 1: no intervention; Group 2: fluoride gel application; Group 3: application of Fluorniz ® varnish; Group 4: application of Duofluorid XII® varnish. Children were examined at daycare center at the beginning of the study and every 6 months (up to 12 months), the interventions were performed on the same occasions. Data were analyzed by Mann-Whitney test, and values $p<0.05$ were considered statistically different.
Results At 6 and 12 months the number of healthy teeth was higher than the number of teeth with caries lesion, with a statistical difference in all groups studied. When comparing the evaluation period (6 and 12 months) no statistical differences were observed in the group without intervention, fluoride gel, Fluorniz® and Duofluorid XII® varnish alone and had similar effects, therefore were no intergroup differences.
Conclusions Lesions of grooves and fissures in permanent molars either longitudinal follow-up or the use of preventive methods can lead to paralysis of the development of carious lesion, however, this protective effect will depend on the patient's risk of individual caries.

Facial Paralysis Subsequent to Injection Intraoral Anesthetic: a Systematic Review
M. V. Fernández Córdova[1], S. Besnier[1], O. Aceituno[1], V. Herrera[1], I. Valdivia[2]
[1]University of Antofagasta, [2]University of Antofagasta

Objectives To analyze the association intraoral anesthetics injection used in dentistry with the Facial Paralysis.
Methods A systematic review was performing considering the methodology of the Cochrane manual and PRISMA declaration. The search strategy used was the follow: “Palsy AND Facial” and “Paralysis AND Facial” as key concepts; Science Direct, Pubmed and Scopus as databases; searching without year restriction and with the filter “dentistry journal.” The inclusion criteria were the following: studies that describe facial paralysis after or during dental procedures using intraoral anesthetic in humans, published in dental journals. The CARE (Case Reports Statement and Checklist) was applied for methodology evaluation of case reports.
Results 2462 articles were found after the first search (algorithm). After title and abstract revision, 18 articles met the study objectives. After the full reading of these articles, 14 met the inclusion/exclusion criteria and were analyzed (all were case reports). A total of 19 cases described facial paralysis, 13 “early” (presented before 24 hours) and 5 “late” (presented after 24 hours), while one case reported no time of affectation. The main relation described in the “early” cases was the anesthetic effects over the facial nerve, while the mains relation described in the “late” cases was the presence of herpes virus and the vascular effect of vasoconstrictor included in the anesthetic formula. Poor compliance of CARE was observed in the studies included.
Conclusions A scarce and low level of evidence was observed in this study regarding the relation between intraoral anesthetics and facial paralysis was observed in this study.

Evaluation Of The Initial Stability Of Orthodontic Self-Drilling Miniscrews Re-Inserted
F. Nenen[1], R. Oyonarte[1], V. Rojas[1], D. Duran[2], N. Garnica[1]
[1]Universidad de los Andes, [2]Universidad San Sebastián

Objectives The purpose of this in-vitro study was to evaluate the initial stability of miniscrews re-inserted, through maximum insertion torque (MIT) and resonance frequency analysis (RFA), and the structural integrity under scanning electron microscopy (SEM).
Methods Thirty titanium self-drilling miniscrews were inserted with an electric motor, at iliac crest bone of porcine specimens. Later, the miniscrews were deinserted with the same device. These miniscrews were sterilized and re-inserted like the same way as the first insertion, but in another place. After each insertion, MIT and RFA were evaluated. The MIT was assessed through a digital torque meter and the RFA was evaluated through Osstell device, which delivers an “Implant Stability Quotient” (ISQ) value. The structural integrity of the miniscrews was evaluated under scanning electron microscopy (SEM) after the first and second insertion. Descriptive and inferential statistics were performed.

Results The average of MIT value for the first insertion was 13.17 Ncm (SD +/- 4.96) and for the re-insertion was 15.4 Ncm (SD +/- 4.95). The average of ISQ value for the first and second insertion was 49.31 (SD +/-1.86) and 45.74 (SD +/-1.76) respectively. The MIT increased and the ISQ decreased both significantly, at the time of comparing the second insertion with respect to the first. There was a statistically significant negative correlation between the MIT and ISQ at the second insertion. The SEM evaluation showed that after the first insertion, 60% of the miniscrews had damage to their tip and after the re-insertion, the tip damaged increased until it was present in 87% of the miniscrews.
Conclusions Under this study model, re-insertion of self-drilling miniscrews produces a deterioration of the integrity of their tip, affecting the initial stability through the MIT and ISQ values.

Functional Dentition And Its Association With Educational Level: ENS 2016-2017.

D. Ortuno[1], J. Vargas[1], R. Berrios[1], R. Garcia-Huidobro[1], O. Padilla[2], P. Margozzini[2]
[1]Pontificia Universidad Católica, [2]Pontificia Universidad Católica

Objectives: Analyze the association between the educational level (EL) and the prevalence of functional dentition in the population aged fifteen and over, based on the results of the Chilean National Health Survey 2016-2017 (ENS 2016-17).
Methods: With data obtained from the ENS 2016-17, the prevalence of functional dentition (presence of 20 or more teeth in the mouth) was calculated, and its association with the educational level, through logistic regression models and adjusted odds ratios (OR) for the variables sex, age, and area (urban or rural). EL was divided in three categories: low (LE), middle (ME) and high educational level (HE).
Results: The study considered of 5473 individuals, with an average age of 43.13 years old and of which 36.6% were men. The distribution of sample according to EL was 24.3% for LE, 53.9% for ME and 21.8% for HE. The global prevalence of functional dentition was 75.30% [73.98 - 76.62]. In relation to the EL, the prevalence of adjusted functional dentition for LE was 28.82% [25.51-32.13], for ME was 79.53% [78.18-80.88] and for HE was 94.42% [93.23-95.61]. The adjusted OR in subjects of HE was 13.33 [8.02-22.15] and in ME was 2.81 [2.03-3.87] with respect to the LE (OR = 1). In men, the prevalence of functional dentition for each category of EL was 31.83% [26.04-37.61] for LE, 82.20% [80.36-84.04] for ME and 94.50% [92.83-96.15] for HE. In women, the prevalence of functional dentition in LE was 26.74% [22.86-30.62], 77.03% [75.20-78.86] in ME and 94.34% [93.06-95.63] in HE. The differences in prevalence were all statistically significant (p-value<0.01).
Conclusions: This study showed that a low educational level was associated with a significant tooth loss in the Chilean population. Similarly, there is a gradient in the prevalence of functional dentition which increased as the educational level of individuals increases, independent of age.

Prevalence Of Open Bite In Barros Luco Trudeau Hospital Complex

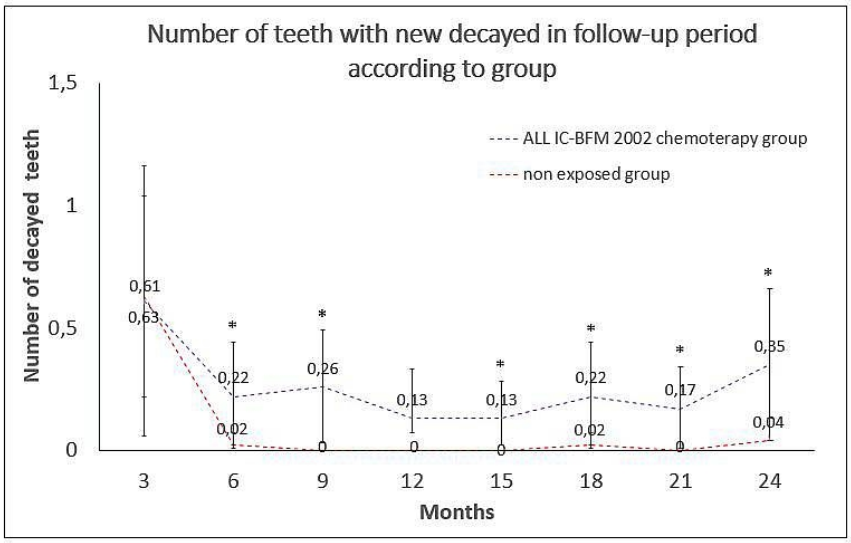
F. L. Zafe[1], J. P. Scheu[1], F. Keith[2]
[1]Universidad Mayor, [2]Universidad San Sebastian

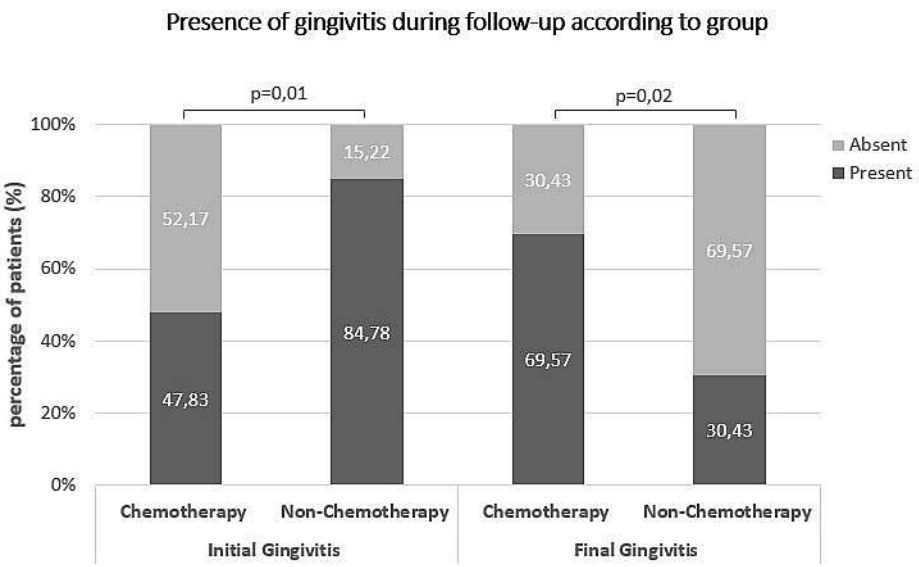
Objectives The aim of this study was to assess the number of patients with an open bite in the Barros Luco Trudeau Hospital Complex who started orthodontic treatment between the years 2011 and 2019.
Methods A sample of 250 children, 126 males and 124 females, who started orthodontic treatment between the years 2011 and 2019 from the Barros Luco Trudeau Hospital Complex in the south area of the city of Santiago, Chile, was analyzed.
Inclusion criteria included males and females, from ages 5 to 15 years old at the time they had their first visit in the orthodontic service of the hospital, with an open bite.
Results The studied sample consisted of 250 children, where 47 of them showed an open bite malocclusion, which correspond to 18.8% of the total.
Conclusions The open bite is a condition in which certain opposing teeth fail to establish occlusal contact when the jaws are closed. This condition does not only affect the patients ability to cut the food, but it does also affect the speech and self-esteem. Its therapeutic approach commonly consists of orthodontic treatment involving vertical control and/or anterior dental extrusion with removable or fixed appliances. Its prevalence among a chilean population of the Barros Luco Hospital between 2011 and 2019 was 18.8%, in a sample of 250 children without gender distinction.

Risk Factor Of Chemotherapy For Caries And Gingivitis In Children

P. Aravena Torres[1], P. Escobar[1], A. Shayani[1], Y. Diocares[1], C. Angulo[1], C. Rodriguez-Salinas[1], C. Rivera[2]
[1]Universidad Austral de Chile, [2]Universidad de Talca

Objectives To evaluate chemotherapy as a risk factor for caries lesions and gingivitis in children with acute lymphoblastic leukemia (ALL) treated with the ALL IC-BFM 2009 chemotherapy protocol compared to a group of unexposed children treated in Valdivia, southern of Chile between 2010 and 2016.
Methods Retrospective cohort study. Clinical records of 23 pediatric patients were analyzed according to the selection criteria [mean 6.67 (SD 2.86) years old] with a diagnosis of ALL exposed to chemotherapy according to the ALL IC-BFM 2009 international protocol in the Regional Hospital in Valdivia and 46 unexposed patients [7.11 (SD 1.59) years old] in the pediatric dental clinic at the Universidad Austral de Chile assessed every 3 months for 24 months. Data on sex, age, subjects' caries status (number of decayed, missing or filled permanent teeth [DMF-T]), number of teeth with new caries and the presence of gingivitis were recorded (Mann-Whitney U test and logistic regression analysis, $p \leq 0.05$).
Results The DMF-T of the children after chemotherapy [mean 1.58 (SD 2.87)] increased significantly compared to the unexposed children [mean 0.31 (SD 0.64); $p < 0.01$. A significantly greater frequency of gingivitis (69.57%; $p < 0.002$) and average of new caries lesions was observed in children treated with chemotherapy than in the unexposed children ($p < 0.01$). The ALL IC-BFM 2009 chemotherapy protocol presented a relative risk of 2.15 (95% CI = 1.22 - 2.66; $p = 0.01$) for new caries lesions and 2.29 (95% CI = 1.76 - 3.82; $p = 0.002$) for the presence of gingivitis.
Conclusions The ALL IC-BFM 2009 chemotherapy in patients with ALL is a risk factor for new caries lesions and gingivitis. It is suggested that prevention and education measures with respect to a non-cariogenic diet, hygiene and use of fluorides be increased in patients undergoing chemotherapy treatment.





Incomplete hemiarch influences the lower third molars position. Radiographic study.

O. Aceituno[1,2], S. Besnier[1], M. Fernández[1], D. Poblete[1], J. De la Rivera[1], N. Ferrer[3,2]
[1]Universidad de Antofagasta, [2]Universidad de Antofagasta, [3]Univeristy of Antofagasta

Objectives To compare the anatomical position of the lowers third molars (LTM) between complete hemiarch (CH) and incomplete hemiarch (IH), by orthopantomography analysis obtained from the Dentistry Department of the University of Antofagasta.
Methods 150 orthopantomography were analyzed. Winter classification was applied for LTM position, considering: Vertical "V", Disto-angled "DA", Mesio-angled "MA", Horizontal "H", Inverted "I", Vestibule-version "VV" and Palato-version "PV". Pell and Gregory (PyG) classification was also applied, which consider molar localization by analyzing the horizontal and vertical third molar position. The horizontal position is described by roman numbers (I to III) and the vertical position with letters (A-C). For example, in the position IA, the number I considers the LTM position at the same level of the second molar occlusal plane, and the letter A considers the LTM position with sufficient space between the mandibular ramus (anterior border) and the lower second molar for the LTM eruption. Descriptive and comparative statistical analysis of variables were performed between CH and IH.
Results 108 LTM from CH were observed with the following distribution: Winter, “V” 59.3% (64), “M-A” 21.3% (23), “H” 13% (14); PyG, Class IA 41.7% (45), Class IIB 26.9% (29) and Class IIA 13.9% (15). On the other hand, 84 LTM from IH were observed with the following distribution: Winter, “V” 51.2% (43), “M-A” 33.3% (28) and “H” 11.9% (10). PyG, Class IA 63.1% (53), Class IIA 13.1% (11) and Class IIB 7.1% (8). Chi-square statistical analysis showed significant difference between CH and IH in relation to PyG classification (p-value=0.03). Winter Classification of LTM showed no differences (p-value= 0.628).
Conclusions The LTM from IH were more erupted than those found in CH. On the other hand, the partial teeth loss in the hemiarch does not affect the position of the LTM according to Winter classification.

Effect Of Boldine On Alveolar Bone Resorption During Periodontitis

N. Faúndez Alarcón[1], R. Barrera[1], N. González[1], R. Vernal[1], E. A. Cafferata Chea[1], C. Terraza[1], C. Cortez Plaza[2], B. Cassels[3]

[1]Universidad de Chile, [2]Universidad Mayor, [3]3Chemistry Department, Sciences Faculty, Universidad de Chile

Objectives Boldine is an alkaloid present in the leaves and bark of Boldo, a Chilean native tree. Traditionally, boldine has been described as a potent natural antioxidant with anti-inflammatory and anti-tumor capacities. Recently, boldine has been associated with inhibition of joint subchondral bone resorption in an animal model of rheumatoid arthritis, by modulating the T-lymphocyte-mediated immune response. Similar than rheumatoid arthritis, periodontitis is characterized by bone resorption and this periodontitis-associated alveolar bone resorption is caused by an immune imbalance; in particular, an imbalance between the Th17-type and T regulatory (Treg)-type of immune response. Thus, this study aimed to determine the role of boldine in alveolar bone resorption during periodontitis and the modulation of the periodontal Th17/Treg imbalance.

Methods 8-weeks-old mice affected with ligature-induced experimental periodontitis were treated with local or systemic administration of boldine during 15 days. Sham-treated periodontitis and non-infected mice were used as controls. Alveolar bone levels were quantified by micro-computed tomography. The presence of TRAP+ osteoclasts and detection of RANKL and OPG in periodontal lesions were analyzed by histochemistry and immunohistochemistry, respectively. The expression levels of Th17 or Treg-related cytokines were quantified by qPCR. Finally, the Th17 and Treg periodontal infiltration were quantified by flow cytometry.

Results In a dose-dependent manner, boldine-treated periodontitis mice revealed lower levels of alveolar bone resorption compared with sham-treated periodontitis mice, and these lower levels were associated with fewer osteoclast and RANKL detection. In addition, boldine-treated mice shown lower Th17-type of cytokine expression and Th17-cell periodontal infiltration, as well as higher Treg-type of cytokine expression and Treg periodontal infiltration, compared with sham-treated periodontitis mice.

Conclusions Boldine inhibits alveolar bone resorption during periodontitis and this inhibition could be explained, at least partly, by modulation of periodontal Th17/Treg imbalance.

Occlusal Appliances Effects on Airway and Respiratory Variables: Systematic Review

A. Jimenez-Silva[1], J. Flores-Ramos[3], J. Sandoval-Mella[4], S. Vivanco-Coke[5], C. Beltrán-Devaud[4], R. E. Frugone-Zambra[2]

[1]Universidad Andrés Bello, [2]Universidad de La Serena, [3]Universidad Autónoma de Nayarit, [4]Universidad Autónoma de Chile, [5]Universidad de Chile

Objectives To evaluate the effect of occlusal appliances used in management of temporomandibular disorders (TMD) and sleep bruxism (SB) on airway and other respiratory variables

Methods An electronic search was conducted between 1960 and 2018 in PubMed, Cochrane Library, Embase, EBSCOhost, Web of Science, ScienceDirect, Lilacs, Bireme and Scielo including all languages. The articles were selected and analyzed by two authors independently and the methodology of selected studies was assessed by The Grading of Recommendations Assessment Tool, Development and Evaluation (GRADE)

Results 3182 potentially eligible articles were identified in the first approach and finally 5 studies were included according to inclusion criteria. 3 were randomized clinical trial (RCT) and 2 controlled clinical trial (CCT). The studies were grouped according to the occlusal appliance therapy in: (a) sleep bruxism (n=2); (b) temporomandibular disorders (n=1) and (c) patients without sleep bruxism and TMD (n=2). One study concluded that the use of OA produces effects on the airway in patients with sleep bruxism and two studies showed increased of apneic events, increase of Apnea-Hypopnea Index (AHI) and an increase in the percentage of sleep time with snoring by 40% in subjects with OSA. The quality of evidence was low due to high risk of bias according GRADE assessment

Conclusions The amount of evidence was limited with a low quality, so it was not possible to establish consistent conclusions on this topic. Due to heterogeneity of the designs and methodologies it is not possible to assert that occlusal appliance could produced changes in respiratory variables in TMD, AHI and SB patients. RCTs are required, with higher levels of evidence to determine a possible effect of OA on respiratory variables and airway

TNF-α increase Cdk5 activity in the spinal trigeminal nucleus at brainstem

C. Duran, R. Sandoval, N. Pinto Pardo, E. Utreras
Universidad de Chile

Objectives Cdk5 is involved in orofacial pain through phosphorylation of several channel/receptors expressed in trigeminal sensory neurons. Previously, we demonstrate that TNF-α increase p35 protein expression and Cdk5 kinase activity in trigeminal ganglion from TNF-α conditional transgenic mice (TNF-α cTg). Here, we evaluate whether TNF-α secreted by central projections of trigeminal neurons of TNF-α cTg mice, could regulates Cdk5 kinase activity in the Spinal Trigeminal Nucleus (STN), place where first synapse occurs between trigeminal sensory neurons and second-order neurons located in brainstem.
Methods By western blot, ELISA, and immunofluorescence analysis, we evaluated TNF-α protein expression, signaling (p-p65 and IL-6), and neuronal (p-ERK1/2) and glial (GFAP) activation in the STN from TNF-α cTg and control mice. We also evaluated Cdk5/p35 protein expression and Cdk5 kinase activity in the STN from TNF-α cTg and control mice.
Results We did not find significant changes in TNF-α protein expression between STN from TNF-α cTg and control mice. Nevertheless, we report a significant increase in TNF-α signaling (p-p65 and IL-6), neuronal activation (p-ERK1/2), and glial activation (GFAP) in the STN from TNF-α cTg as compared with control mice. Importantly, we found a significant increase of both p35 and Cdk5 protein expression, as well as Cdk5 kinase activity in the STN from TNF-α cTg mice as compared with controls mice.
Conclusions We demonstrate that chronic secretion of TNF-α from primary nociceptive neurons to STN increase neuronal and glial activation and Cdk5 kinase activity, suggesting that Cdk5 could play a role in central sensitization and/or maintenance of chronic pain.

Biodentine Generates Cellular Cytotoxicity and Induces Specific Apoptotic Activity

P. Romero Araya, M. F. Flores, F. Pavicic
Universidad Austral de Chile

Objectives The objective of this research work was to evaluate endodontic cement based on tricalcium silicate Biodentine according to its biological properties, specifically its ability to generate cell proliferation. This is why the viability, cell cytotoxicity and the capacity to induce apoptosis by the biomaterial on of human dental pulp cell cultures (HDPCs) were studied.
Methods HDPCs were obtained through primary cultures. The Biodentine preparation was carried out following the manufacturer's instructions, preparing cement disks (6 x 2 mm) under luminous flux and sterilized by UV radiation. The cytotoxicity and cell viability was measured under the MTT colorimetric method. Besides, the ability to induce apoptosis by Biodentine was performed through *Western Blot* immureactivity assays for the visualization of three apoptotic proteins; *Caspase 3*, *Caspase 3 clivated* and *PARP -1*. All trials were conducted in three study times 24, 48 and 72 hours, compared with a control group cultured with *DMEM*.
Results The results show high cytotoxic activity and low viability by Biodentine ($p < 0.05$) at 24, 48 and 72 hours of exposure compared to control group. In addition, the cement demonstrates high expressivity of *Caspase 3 clivated* at 48 and 72 hours ($p < 0.05$) and *PARP-1* at 48 hours ($p < 0.05$) and 72 hours ($p < 0.001$) compared to control group.
Conclusions Biodentine exhibits cytotoxic, low viability and specific apoptotic activity on HDPCs. While this study demonstrates the expression of apoptotic proteins, previous trials have also demonstrated apoptotic activity. This is why the use of this biomaterial should be studied for each particular clinical case, especially as a direct pulp capping agent.

Third Molar Agenesis and Mandibular Morphology, A Geometric Morphometry Study.

S. Hodali, V. Toro Ibacache, L. Araneda, A. Diaz
Facultry of Dentistry, University of Chile

Objectives To evaluate the relation between third molar agenesis and mandibular size and morphology.
Methods The panoramic radiographs of 84 patients (aged 14+) were divided into four groups: agenesis of 38 (38A), 48 (48A) or both (BilA), and control (NonA) group without agenesis. Twenty-two landmarks representing mandibular morphology(fig. 1) were used in subsequent geometric morphometric analyses. Shape variables, controlled by sex, underwent principal components analysys (to assess general shape variation), and canonical variate analysis (to assess differences among groups).
Results Aproximately 70% of the sample's variability was discribed by the first three principal components, with a large amount of shared traits among groups. When group structure was considered, subtle differences were found: NonA and BilA are more similar and symmetric, with only small differences in the size of the condylar and coronoid processes. 38A and 48A showed more marked differences, related to asymmetric features resulting in more gracile features in the ramus and body of the affected side of the mandible. None of these differences were statistically significant.
Conclusions Subtle differences can be found in the shape of the mandible of individuals which have one, two or none agenesic third molars. Specifically, when only one mandibular third molar is agenesic, there is a slight asymmetry consisting in more reduced features in the side of the agenesis. In comparison, when both molars are agenesic, a slightly more gracile, but symetric mandible can be seen.

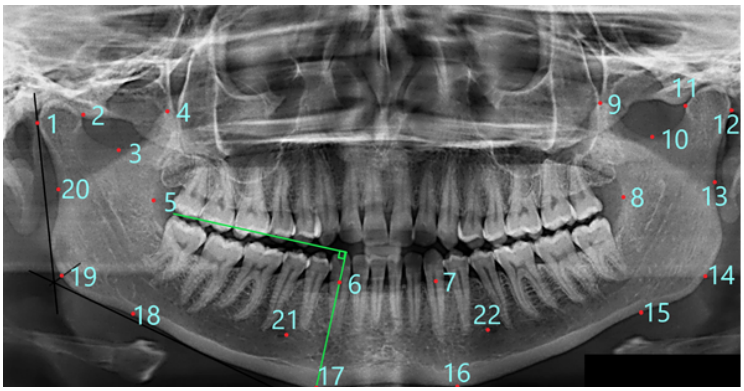


fig. 1

3 Months follow-up Clinical Performance Dual-Cure Bulk-Fill Composite.

j. Pizarro, T. Espinosa, B. Moya, M. Muñoz, S. Rodriguez, F. Silva
Universidad Andres Bello

Objectives Evaluate clinical performance in proximal or occlusal restorations with dual-cure Bulk- Fill and compare to nanofilled composite by Ryge criteria.
Methods 47 voluntary patients with 2 proximal or occlusal caries lesions in posterior teeth with proximal and antagnist teeth. The depths of the lesions were ≥ 3.5mm.. Were distributed randomly: Group FU: 47 Fill-Up resins Bulk-fill-Brilliant Everglow (Coltene) and Group Z350: 47 restorations Filtek Z350 (3M-Espe). The restorative procedure was performed with absolute isolation. The proximal preparations was used sectional matrix system and wooden wedge. Preparations were conditioned in enamel for 20 seconds with 37% phosphoric acid. Single Bond Universal adhesive (3M-Espe) was applied for Z350 and One Coat 7 Universal in the cavities of the FU (Coltene) according to manufacturer's instructions. The FU restorations were done with an only layer (≥3mm) and a final layer with Brilliant Everglow. Z350 were restored with 2 mm multilayer. Restorations were polymerized for 30 seconds with a Bluephase light-curing unit (Ivoclar-Vivadent) with an intensity of 1.100mW/cm2. Calibrated operator (Kappa>0.8) evaluated the restorations by Ryge criteria; marginal staining (MS) and adaptation (AM), anatomy (A), postoperative sensibility (S) and caries (C) from the baseline to 3 months. The Wilcoxon test was used for the statistical analysis. (95 % of significance).

Results 3 months for follow-up were evaluated 47 patients (N total=94). Score alpha for AM was 100% Z350 and 97,8 % for FU; MS, A,S and C there were 100% for both groups. There were not significant differences between the groups (p >0.05).
Conclusions For 3 months follow up the two posterior restorations composites there were not significant differences in clinical performance evaluated by Ryge criteria.

Shear Bond Strength of Recycled Brackets Using Different Adhesive Materials.
N. Ibarra Robert[1], R. Oyonarte[1], V. Rojas[1], C. S. Sampaio[2,1]
[1]Universidad de los Andes, [2]University of Campinas - UNICAMP

Objectives To determine and compare the shear bond strength (SBS) of new and recycled orthodontic brackets bonded to enamel, using two different adhesive materials. To compare enamel surface and bracket base characteristics after SBS test.
Methods A total of 72 extracted human premolars were collected and randomly divided into 6 groups representing different adhesive treatments, using light cured composite (LCC) and resin-modified glass ionomer (RMGI): group 1 (control), new bracket bonded for the first time/ LCC; group 2 (control), new bracket bonded for the first time/ RMGI; group 3, rebonding with a new bracket/ LCC; group 4, rebonding with a new bracket/ RMGI; group 5, rebonding with a recycled bracket/ LCC; group 6, rebonding with a recycled bracket/ RMGI. For groups 5 and 6, the same brackets were sandblasted, bonded and debonded for SBS testing. SBS was recorded in all groups using a Bisco® testing machine. Enamel and bracket bonding interfase were assessed using light microscopy. Adhesive remnant (AR) on bracket base was calculated using a computer software.
Results Bracket type effect: No statistically significant differences were found in SBS and percentage of AR between new or recycled brackets (groups 1, 2, 3, 4 5 and 6). Adhesive type effect: LCC SBS was significantly higher than RMGI (p-value= 0,00592). Also, brackets bonded with LCC showed significantly higher AR than those bonded with RMGI (p-value= 0,00013). There are no statistically significant differences for the presence of enamel fractures between groups.
Conclusions Bracket recycling during rebonding is a reliable option in terms of bond strength. According to the literature, both LCC and RMGI accomplish acceptable SBS values. The clinical meaning of these results is that clinicians could use either of these types of adhesive, focusing on patient needs. Also, enamel fractures after debonding were not associated with any type of adhesive system or bracket.

Orthodontic treatment needs in 12 years old children of Cochrane
C. F. Ayala Arratia[1], R. I. Botello Cordano[1,4], R. A. Johnson Vera[3], P. Araya[4], A. L. Silva[1,2]
[1]Universidad de Chile, [2]Hospital San José, [3]Hospital de Cochrane, [4]Universidad Andres bello

Objectives Introduction: The city of Cochrane has a population of 728 children under 15 years old, of which 53% could present malocclusions (according to statistics from MINSAL 2007). Cochrane patients referred to orthodontics,must travel to Coyhaique, 331 kilometers away, and only 15 patients entered each year in the fixed orthodontic program of the public health insurance FONASA. Thus,it is necessary to prioritize the referral of patients with greater need for treatment.
Goals:
Evaluate the orthodontic treatment needsin 12 years old children of Cochrane
Evaluate the level of agreement by the three operators
Methods Method: Three operators individually evaluated the orthodontic treatment needs in thirty nine adolescents out of the forty-four 12-year-old students enrolled in Cochrane Elementary School. Operator A, prior calibrated with an expert (Kappa 0.81), used the "Clinical Reference Guide and Orthodontics for Public Health Services (GRCO)", astandardized and validated instrument. Operator B, applied the GRCO without prior calibration; and Operator C, carried out the evaluation without any guidance. Data were tabulated and the level of concordance was determined with Cohen's Kappa calculation.
Results Results: Of the 39 patients evaluated, Operator A referred 20 patients (51.3%), Operator B referred18 (46.2%) and Operator C referred 23 (59%). The level of concordance obtained was moderate between Operator A and B (0.59); moderate between Operator A and C (0.53) and discrete between Operator B and C (0.342).
Conclusions Conclusions: The low concordance between operators, indicate the need to standardize the referral criteria to the orthodontic specialty.

Perception of Educational Environment from the Undergraduate Dentistry Students.

N. Ferrer[1,2], M. V. Fernández Córdova[3], S. Besnier[4], O. Aceituno[5], I. Valdivia[2]
[1]Univeristy of Antofagasta, [2]Univeristy of Antofagasta, [3]University of Antofagasta, [4]Univeristy of Antofagasta, [5]Universidad de Antofagasta

Objectives To measure the perception of educational environment (PEE) considering the opinion of the undergraduate dentistry students from the University of Antofagasta (UA).
Methods The social study was approved by the ethical committee from UA. DREEM survey (Dundee Ready Educational Environment Measure) was applied to the students from the second to the sixth-year undergraduate dentistry degree. The sample was intentional because it included all students presents at the moment of the survey application. The survey was validated for its use in Spanish and in Chile. DREEM survey has 50 questions and classifies the educational environment in according to the following score: 0-50 points, "Poor PEE"; 51-100 points, "PEE with many problems"; 101-150 points, "PEE more positive than negative"; 151-200 points, "Excellent PEE". Global analysis of the sample and the comparison among the undergraduate levels were realized. ANOVA test was applied by SPSS software.
Results A total of 209 surveys were correctly completed, 41, 42, 41, 47 and 38 from the second, third, fourth, fifth, and sixth undergraduate level respectively. The global average was 107.2, that means a more positive than negative educational environment perception. On the other hand, the average of undergraduate levels in ascendant order was 120.7, 106.9, 101.6, 107.5 and 96.9. ANOVA test showed a statistical difference ($p<0,05$) among DREEM punctuation obtained from the different undergraduate levels.
Conclusions In general, the perception of educational environment observed is more positive than negative, except for the students from the final course (sixth-year), who seem to have "many problems". Additionally, the results observed showed lesser values in comparison to another dental school in Chile. Future studies are necessary to establish the factors that affect the educational environment analyzed in this study and their possible solutions.

SIX MONTH FOLLOW-UP CLINICAL PERFORMANCE PROXIMAL BULK-FILL COMPOSITES

N. F. Caro Hidalgo, M. Medina, C. Florido, T. Coloma, S. Rodriguez, J. Nakouzi
Universidad Andrés Bello

Objectives Compare to 6-month follow-up of clinical performance in proximal restorations with two Bulk- Fill composite and nanofilled composite by FDI criteria.
Methods 52 patients with 3 proximal caries lesions in posterior with antagonist and proximal teeth. The depths of the lesions were ≥ 3.5mm. Were distributed randomly: Group TB: 52 Resins Bulkfill Tetric N-Ceram (Ivoclar Vivadent), Group FB: 52 restorations Filtek Bulkfill (3M-Espe) and Group control Z350: 52 restorations Filtek Z350 (3M-Espe). The restorative procedure was done with absolute isolation. Used proximal matrix sectional system and wooden wedge. All preparations were conditioned in enamel for 20 seconds with 37% phosphoric acid and applied adhesive Single Bond Universal (3M-Espe) of the groups FB and Z350 and TB group was applied adhesive AdheSE Bond Universal (Ivoclar-Vivadent). Steps adhesive were according manufactures instructions. The TB and FB restorations were done with an only layer (maximum deep 4mm) and Z350 was restored with 2 mm deep multilayer. Restorations were polymerized for 30 seconds with a Bluephase light-curing unit (Ivoclar-Vivadent) with intensity of 1.100mW/cm2. Calibrated operator (Kappa>0.8) evaluated the restorations by FDI criteria, adaptation (AM), marginal staining (MS), surface lustre (SL), proximal contact (PC), fracture-retention (FR) sensibility (S) and caries (C) 6 month later. For the statistical analysis of the test Friedman was used (95 %of significance).
Results For follow-up 6 months were evaluated 40 patients (N=120). There were 100% score 1 for FR, PC, C and S. There was score 1 for: AM 93%(37) in Z350, 98%(39) FB and 95%(38) TB; MS 88%(35), 93%(37) FB and TB; SL 98%(39) Z350, 95%(38) and 98%(39) TB. There was not significant difference between the groups ($p >0.05$).
Conclusions Two bulk-filled proximal composites had not significant difference in 6-month follow-up compared with nanofilled control restorations evaluated by FDI.

CLINICAL STUDY 9 MONTH FOLLOW-UP CERVICAL TWO BULK-FILL COMPOSITES

J. Carrasco Galleguillos, K. Adasme, F. Monterey, K. Maturana, C. Espinoza, P. Vildósola
Universidad Andrés Bello

Objectives Compare to 9-month follow-up of clinical performance cervical lesion (LC) restorations with two Bulk-Fill composite and nanofilled composite by FDI criteria.
Methods 46 patients, with at least 3 cervical lesions in posterior teeth. The depths of the lesions were ≥ 1.5mm with antagonist teeth. Were distributed randomly: Group TB: 46 Resins Bulkfill Tetric N-Ceram (Ivoclar Vivadent), Group FB: 46 restorations Filtek Bulkfill (3M-Espe) and Group control Z350: 46 restorations Filtek Z350 (3M-Espe). The restorative procedure was done isolation. The preparations were conditioned in enamel for 20 seconds with 37% phosphoric acid and then rinsed, dried. Adhesive Single Bond Universal (3M-Espe) was applied of groups FB and Z350; while the Adhesive Bond Universal (Ivoclar-Vivadent) was applied of the TB group according manufactures instructions. The TB and FB restorations were done with an only layer and Z350 was restored with multilayer. All was polymerized for 30 seconds with a Bluephase light-curing unit (Ivoclar-Vivadent) with intensity of 1.100mW/cm2. Calibrated operator (Kappa>0.8) evaluated the restorations by FDI criteria for fracture-retention (FR), adaptation marginal (AM), marginal staining (MS) and sensibility (S) and caries (C) baseline and 9 month later. For the statistical analysis of the information software SPSS 21.0 was used, Friedman tests were used (95 %of significance).
Results 9 follow-ups were evaluated 44 patients (N total=132 restoration). There was loss of retention in 2 restorations for Z350 and 1 restoration for TB and FB. Score 1 for AM;Z350 91%(40), FB 96%(42), 93%(41) TB. Score 1 in MS of Z350, FB and TB was: 84%(37), 91%(40), 98%(43) respectively. Score 1 for S: Z350 91%(40), FB 93%(41), 98%(43). No caries in the three groups. There was not significant difference between the groups in the 9-month ($p > 0.05$).
Conclusions Two bulk-filled (LC) composites had not significant difference in 9-month follow-up compared with nanofilled control restorations evaluated by FDI.

Low-fluoride dentifrices containing trimetaphosphate and polyols on enamel erosion.

P. T. Alves de Toledo, A. C. Delbem, A. E. Sakamoto, M. E. Silva, D. Pedrini
São Paulo State University (UNESP), School of Dentistry

Objectives This *in vitro* study evaluated the effect of low fluoride (200 ppm F) dentifrice associated with sodium trimetaphosphate (TMP) (0.2%), 16% xylitol and 4% erythritol on initial enamel erosion.
Methods Bovine enamel blocks were selected by initial surface hardness (SHi) and divided into 5 groups (n=12/group): placebo (no fluoride, TMP, xylitol and erythritol); 16% xylitol + 4% erythritol (XE); 200 ppm F + 0.2% TMP (200TMP); 200 ppm F + 0.2% TMP + 16% xylitol + 4% erythritol (200TMP+XE); and 1100 ppm F. For the analysis of the protective effect, sound enamel were immersed in toothpaste slurry in human saliva once for 2 minutes. Hereafter, enamel blocks were submitted to 4 erosive challenges in citric acid (0.75%, pH 3.5) by 1 minute, under stirring. For the analysis of the repair effect, demineralized enamel were treated and submitted to erosive challenges as describe previously. Percentage of surface hardness change (%SH) was calculated after treatments, demineralization, and 1, 2, 3 and 4 minutes. Variables were submitted to two-way repeated measures analysis of variance followed by Student-Newman-Keuls test ($p<0.05$).
Results The successive challenges increased the enamel softening independent of the group ($p<0.001$). The 200TMP+XE group presented the highest protective capacity followed by XE>200TMP=1100 ppm F>Placebo ($p<0.05$). The highest reparative ability was observed with 200TMP+XE toothpaste followed by XE>200TMP>1100 ppm F>Placebo ($p<0.05$). The product formed with 200TMP+XE toothpaste was more resistant to successive acid challenges than XE, 200TMP and 1100 ppm F.
Conclusions It was concluded that the toothpaste containing 200 ppm F, 0.2% TMP and XE showed superior ability to resist and repair initial erosive lesions.

External Intercostal Electromyographic Activity Between Subjects With Different Laterotrusive Schemes.

R. Miralles[1], S. M. Valenzuela[2,1], C. Marambio[1], M. Gutierrez[2,1], N. Gamboa[2,1], A. Fuentes[2,1], H. Santander[1,3], C. Zuñiga[4,1], R. Bull[1]

[1]University of Chile, [2]University of Chile, [3]University of Chile, [4]Universidad Finis Terrae

Objectives To compare the effect of canine guidance or group function on external intercostal (EI) electromyographic (EMG) activity, heart rate and oxygen saturation during awake tooth grinding and chewing.

Methods Fifty healthy male participants, 25 with canine guidance and 25 with group function were included. They had complete natural dentition, canine Class I or II and no history of orofacial pain. Bilateral EMG recordings (μV) of EI muscles were performed during clenching in the maximum intercuspation (MIC), during continuous tooth grinding from MIC to right lateral edge-to-edge contact position and vice versa, and chewing at seated upright position. Simultaneously, heart rate and oxygen saturation were 1measured with a fingertip pulse oximeter (Choicemmed®). The mean value of the three EMG recordings, heart rate and oxygen saturation obtained for each condition were used for the statistical comparisons. Statistical significance was defined in $\alpha = 0.05$.

Results EMG activity during awake tooth grinding, heart rate and oxygen saturation presented a non-normal distribution ($p < 0.05$; Shapiro-Wilk test), therefore a Mann-Whitney *U*-test was used to compare these variables between both groups. EMG activity of EI muscles was similar in the working side as well as in the non-working side between participants with canine guidance and group function. The heart rate and the oxygen saturation showed no significant differences between both groups.

Conclusions The results suggest that the activity of EI in its role as an obligatory respiratory muscle is not significantly modified by the laterotrusive occlusal scheme.

Association between LINE-1 Hypomethylation and the Risk of Non-Syndromic Orofacial Clefts in a Chilean Population.

G. Cáceres Rojas[1,2], A. Recabarren[1], B. J. Krause[3], J. Suazo[1]

[1]Universidad de Chile, [2]Universidad de Chile, [3]Pontificia Universidad Católica de Chile

Objectives Nonsyndromic cleft lip with or without cleft palate (NSCL/P) is one of the most common birth defects worldwide and in Chile. Numerous studies show that changes in the DNA methylation are present in different pathologies. This study aims to evaluate the association of the global methylation levels of the DNA, using the methylation of Long Interspersed Nuclear Elements 1 (LINE-1), and the risk of non-syndromic orofacial clefts in a Chilean population.

Methods In a pilot study, we evaluated 45 case and 43 controls paired by age and sex. Oral mucosa swabs were taken from them and total DNA was extracted. We evaluated the global methylation status using 4 points susceptible of methylation of the repetitive elements LINE-1, the percentage of methylation in each point was measured using pyrosequencing of bisulfite-modified DNA. Then, these levels were compared in case and controls.

Results Our preliminary results showed that there are lower levels of methylation of LINE-1 in global terms in the cases (mean=63.42%+/-5.39) than the controls (mean=67.06%+/-8.2) (p-value=0.0078). The analysis point by point showed no difference in 1 point comparing cases (mean=69.62%+/-6.46) and controls (mean=70.12%+/-11.21) (p-value=0.3998) and the other 3 points presents lower levels of methylation in the cases (mean=58.93%+/-5.18; 59.11%+/-6.6; 66.02%+/-6.43) than the controls (mean=61.42%+/-5.19; 65.49%+/-9.54; 71.21%+/-9.89) (p-values=0.0136; 0.0002; 0.0022 respectively).

Conclusions The results suggest an association between hypomethylation of the repetitive elements LINE-1 and the risk of non-syndromic orofacial clefts in Chilean population. These results are in concordance with a previous study which reported lower levels of 5-methyl-cytosine in Chilean patients with non-syndromic orofacial clefts.

Missing teeth affect anatomical position of the upper third molars

S. Besnier[1], M. V. Fernández Córdova[2], O. Aceituno[1], D. Poblete[1], W. Astudillo[1], N. Ferrer[3]
[1]Univeristy of Antofagasta, [2]University of Antofagasta, [3]Univeristy of Antofagasta

Objectives To compare the anatomical position of the upper third molars (UTM) between complete hemiarch (CH) and incomplete hemiarch (IH), by orthopantomography analysis obtained from the Dentistry Department, University of Antofagasta.
Methods 154 orthopantomography were analyzed. Winter classification was applied for UTM position, considering: Vertical "V", Disto-angled "DA", Mesio-angled "MA", Horizontal "H", Inverted "I", Vestibule-version "VV" and Palato-version "PV". Retromolar space (for eruption) was also studied, considering: Sufficient "S", Reduced "R" and Insufficient "In". Finally, eruption level was also identified considering: "A", at the level of the occlusal plane of the second molar (SM); "B", between occlusal plane and the cervical line of the SM; "C", apical to the cervical line of the SM; "D", over the occlusal plane of the SM. Descriptive and comparative statistical analysis of variables were performed between CH and IH.
Results 116 UTM from CH were observed with the following distribution: Winter, “V” 78.4% (91), “D-A” 12.9% (15) and M-A 8.6% (10); Retromolar Space, “S” 65.5% (76), “R” 25% (29) and “In” 9.5% (11); Eruption Level, “A” 58.6% (68), “C” 20.7% (24), “B” 11.2% (13) and “D” 9.5% (11). Besides, 59 UTM from IH were observed with the following distribution: Winter, “V” 69.5% (41), “D-A” 23.7% (14) and “M-A” 3.4% (2); Retromolar Space, “S” 65.5% (76), “In” 18.6% (11) and “R” 10.2% (6); Eruption Level, “A” 45.8% (27), “B” 30.5% (18) “C” 20.3% (12) and "D" 3.4% (2). Chi-square statistical analysis showed significant difference between CH and IH in relation to Retromolar Space (p-value = 0.029) and Eruption Level (p-value = 0.010) of UTM. Winter Classification of UTM showed no differences (p-value = 0.070).
Conclusions Preliminary, the hemiarch with missing teeth seems to modify the Retromolar Space and Eruption Level of the UTM but does not affect their position according to the Winter classification.

Deciduous Teeth are Lesser Affected in Regions with Endemic Fluorosis.

W. Astudillo-Rozas[1,3], A. Vasquez[2], J. De la Rivera[2], I. Valdivia[3], M. García[4]
[1]University of Antofagasta, [2]University of Antofagasta, [3]University of Antofagasta, [4]University of Barcelona

Objectives To compare the dental fluorosis among deciduous, mixed and permanent teeth of children living in a community affected with endemic fluorosis.
Methods The study was authorized by the ethics committee of the University of Barcelona and the Director of the Kalyandur Hospital, India. Children between 4 and 16 years old from the rural community of Anantapur, India, were examined. All examinations were carried out with the prior child consent and informed consent of the parents or legal guardian. The patients were grouped according to the type of dentition in Deciduous, Mixed, and Permanent. Inclusion and exclusion criteria were applied to generate adequate information for the study objectives. Three dentists were calibrated to determine the level of fluorosis by the Thylstrup and Fejerskov Index (ITF), which sets the level of fluorosis from 0 (normal) to 9 (severe). The data were analyzed by the SPSS statistical program and was considered as a level of significance $p < 0.05$.
Results 631 patients met the inclusion criteria (56.9% girls and 43.1% boys). The average age was 10.03 years. A 6% presented deciduous dentition, 70.4% Mixed, and 23.6% Permanent. The 4.9% did not show dental fluorosis (ITF=0), 7.8% had mild dental fluorosis (ITF=1-3), 12% had moderate dental fluorosis (ITF=4-5) and the 75.3% had severe dental fluorosis (ITF=6-9). The Chi-square test did not show significant differences between gender about the severity of fluorosis ($p=0.452$). However, a significant difference was observed among the type of dentition considering the severity of fluorosis ($p<0.05$), being the Deciduous teeth group the least affected.
Conclusions In the study group, dental fluorosis was especially severe in patients with mixed and permanent dentition, regardless of gender, which suggests that fluoride intake transmitted from mother to child during the pregnancy has generated a lesser effect on the deciduous dentition.

Prevalence of dental wear in dental students of Andres Bello University (Santiago) in year 2018

A. Hidalgo, D. Perez, F. Silva, A. Silva, C. Conejeros Arriagada
Universidad Andrés Bello

Objectives Determine the prevalence of dental wear in undergraduate dentistry students of Andres Bello University, Santiago, in year 2018 and analyze if there are differences between the genders, age and compromise of dental sextants.
Methods Accomplished study was descriptive. 200 students from the dental school of the Andrés Bello University were evaluated. Participants were randomly selected according to the inclusion criteria (permanent dentition, without missing teeth that generate spans, absence of diastema) and exclusion criteria (Orthodontic treatment). Intraoral inspection was performed by 2 qualified and calibrated evaluators with an intra and inter examiner using Kappa index (0.8). All patient were recorded using intra oral photographs with Nikon 3100, macro 50mm. Scoring was awarded to examinees according to the BEWE rating. Data were recorded as age, gender, undergraduate year and sextant. To evaluate statistical differences between wear according to BEWE with gender, age, course and sextant, the Chi-square test was used.
Results In relation to gender, 100% of the men presented physiological and / or pathological wear, while 97.4% of the women presented it. In the age distribution, a group between 21-24 years old presented 97.6% with physiological and / or pathological tooth wear, while a group between 25-33 years old presented 99.1%. As for the academic year, 98.7% of students in 4th year presented wear, 98.7% presented 5th year, and 98.1% in 6th year. Finally, a higher prevalence of score 1 was observed in sextant 2 and 5, with 92% and 93.5% respectively.
Conclusions A high prevalence of physiological and / or pathological tooth wear was observed in the undergraduate Dentistry students evaluated. There were no statistically significant differences between tooth wear and the three variables analyzed, however, there is a significant increase in tooth wear in sextants 2 and 5.

Midpalatal Sutural Maturation in Adolescents and Young Adults: Cross-sectional Study.

T. Villarroel, M. J. Alvarado, G. Concha, R. Oyonarte
Universidad de los Andes

Objectives To evaluate midpalatal suture maturation in Chilean adolescents and young adults through morphological assessment of cone-beam computed tomography (CBCT) images of the maxilla.
Methods CBCT volumes from 200 patients (100 women; 100 men), ages 15 to 35 years, were selected from a university clinical center database. In each patient, an axial cross-sectional slice was assessed to determine midpalatal suture maturation, using the method proposed by Angelieri et al., which classifies the state of maturation in 5 stages (A, B, C, D & E). Also, midsutural width was measured in the same axial slice, in two sites (anterior and posterior). Intraexaminer and interexaminer agreements were assessed using Pearson's correlation coefficient, while differences between sutural maturation stage and sex were evaluated with Student's T-Test.
Results High intraexaminer and interexaminer agreement was achieved ($r > 0.94$, $p < 0.00$). The most frequent stage of maturation was stage C (39.5%), followed by stage E (34.5%) and D (24.5%). In men, stage C was most prevalent with 44%, while in women the most frequent stage was stage D with 41%. However, no statistically significant differences were found between sutural maturation stage and sex ($p = 0.114$). In terms of sutural width, the study showed it decreases gradually from anterior to posterior.
Conclusions Although the majority of the sample (59%) was classified into a late stage of sutural maturation, where fusion is observed, the other 41% presented previous stages, where non-surgical sutural expansion is possible. Because of the variability observed in adolescents and young adults, the individual evaluation using CBCT is advised for clinical purposes.

Drug Delivery System for Lidocaine and Sensitization of TRPV1 Receptor

C. Madrid[1], L. Nunes[2], B. Benso[1]
[1]Pontificia Universidad Católica de Chile, [2]Guarulhos University

Objectives Local anaesthetics are clinically used to control pain in dental procedures. Thus, it was seen that lidocaine modulates TRPV1 receptors, which are expressed by nociceptive cells and are activated at high temperatures. We propose a modified drug delivery systems to improve the properties of anaesthetics, increasing the duration of anaesthesia and decreasing the toxicity using complex with 2-hydroxypropyl-β-cyclodextrin (HP-B-CD). The aim of this study was to characterize these molecules, establish optimal pharmacological concentrations and evaluate the activity of the HP-B-CD-Lidocaine complex exposure in TRPV1 pain channels.
Methods The complex inclusion of HP-B-CD and the lidocaine was conducted in 1:1 molar ratio. The solution was shaken for 24h at RT and lyophilizate for storage. To evaluate the stability of samples and possible changes in the crystals after the complexation it was conducted SEM method of analysis. Intracellular calcium measurements were recorded in HEK293 cells transfected with rTRPV1 in different set of concentrations and compared with capsaicin control group. Cell viability was also checked for all concentrations tested in the experiments. For all experiments, nonparametric statistical analysis was used considering gaussian pattern of data distribution and $p<0.05$.
Results The HP-B-CD-lidocaine complex was observed as a three-dimensionally stable molecule. At a concentration of 100 uM HP-B-CD-lidocaine complex demonstrated to enhance the IC50 parameter for cell viability when compared to the lidocaine as itself. The lidocaine hydrochloride alone had a very low ability to activate the TRPV1 channels, however, when complexed with HP-B-CD, an intense signal for calcium levels was found. The HP-B-CD-lidocaine complex is stable and decreases the cytotoxicity of lidocaine in gingival fibroblasts
Conclusions Due to the nature of the TRPV1 channels, pain caused by burns could be blocked locally by HP-B-CD-lidocaine. In addition, this complex could be useful as a drug delivery formulations to treat chronic pain due to the prolonged pharmacological release observed.

Repair Proximal Resin With Bulk-Fill. One Year Follow-Up

J. I. Ramirez[1], D. C. Vasquez[1], P. Vildosola[2], J. Martín[2], S. Rodriguez[2], A. Werner[2]
[1]Universidad de Chile, [2]Universityersidad de Chile, [3]Universidad de Chile

Objectives Evaluate the clinical performance of proximal restorations repaired with Bulk-Fill composite according to the Ryge criteria at a 12 months follow-up and compare to control groups.
Methods 40 voluntary patients, with at least two proximal restorations that had repair indication the proximal box, depths ≥ 3.0 mm and antagonist-proximal contact teeth. Restorations were randomly distributed: group BK: 40 Bulkfill Tetric EvoCeram resins (Ivoclar-Vivadent) and Group Z350: 40 Filtek Z350 resins (3M-Espe). The restorative procedure was done with absolute isolation. Only the restoration sector or damaged tooth was removed. All cavities were total-etch with 37% orthophosphoric acid. Sectional matrix system, wooden edge and adhesive Optidond FL (Kerr) was used for both materials according to manufacturer's instructions. The BK restorations were done with only one layer (4mm maximum deep) and Z350 were restored with 2 mm deep multilayer. Restorations were polymerized for 30 seconds with a Bluephase light-curing unit (Ivoclar-Vivadent) with 1100 mW/cm^2 of intensity. Two calibrated operators intra-inter examiner (Kappa > 0.8) evaluated the restorations using the Ryge criteria at two weeks (Baseline) and at 12 months for: marginal staining (MS) adaptation (D), anatomic (A), surface lustre (SL), sensibility (S) and caries (C). For the statistical analysis using 95% confidence were used Wilcoxon and Mann Whitney.
Results 32 patients were evaluated of the 12 months follow-up (N= 64). Both groups 94%(30) showed score alpha for MS and D. Score alpha for A was Z350 94%(30) and BK 97%(31). Both groups of SL showed 91%(29) like score alpha. There was no score Charlie in any Ryge criteria. There was no significant difference between groups and the baseline ($p >0.05$).
Conclusions According Ryge criteria, repair with BK to 12-months follow-up had no significant difference between baseline neither control restorations.

***In vitro* performance of different universal adhesive systems on CAD/CAM restorative materials after thermal aging**

L. F. Alegria[2], M. F. Gutierrez Reyes[1,3], A. Nuñez[2], M. L. Méndez Bauer[2], A. Reis[4], A. D. Loguercio[4]
[1]University of Chile, [2]State University of Ponta Grossa, [3]Universidad Finis Terrae, [4]State University of Ponta Grossa

Objectives To evaluate the microshear bond strength (mSBS) of ten universal adhesive systems applied on five different CAD/CAM restorative material, immediately and after 10.000 thermo-cycling.
Methods Five CAD/CAM materials were selected: 1) indirect resin composite (InRC); 2) feldspathic glass ceramic (FeCe); 3) leucite-reinforced glass ceramic (LeGC); 4) lithium disilicate (LiDi); 5) yttrium-stabilized zirconium dioxide (ZiDi). For each material, 15 blocks were cut into 4 rectangular sections (6 × 6 × 6 mm; n = 60 per group), and processed as recommended by the respective manufacturer. For each indirect material, the following adhesive systems were applied according to the respective manufacturer instructions: 1) AdheSE Universal [ADU]; 2) All-Bond Universal [ABU]; 3) Ambar Universal [AMB]; 4) Clearfil Universal [CFU]; 5) Futurabond U [FBU]; 6) One Coat 7 Universal [OCU]; 7) Peak Universal Bond [PUB]; 8) Prime&Bond Elect [PBE]; 9) Scotchbond Universal Adhesive [SBU]; 10) Xeno Select [XEN, negative control]. After the application of the adhesive system, cylinder-shaped transparent matrices were filled with a dual-curing resin cement (NX3) and light cured. Specimens were stored in water (37 °C for 24 h) and tested in shear mode at 1.0 mm/min (μSBS). All data were submitted to statistical analysis ($\alpha = 0.05$)
Results The μSBS mean among the different universal adhesives varied widely in each CAD/CAM material used. In addition, all universal adhesives showed a statistically significant reduction in bond strength between the immediate time and after 10,000 thermo-cycling, except AMB, FBU and SBU for the FeCe substrate.
Conclusions Factors such as pH, solvent type and presence of silane and/or MDP in the composition of each adhesive seem to be important in choosing an universal adhesive system for each particular substrate.

Epigenetic control of ATF6a expression in Sjögren's syndrome patients

P. Carvajal[2], C. Lagos[2], I. Castro[2], S. M. González[1], M. Barrera[4], S. Aguilera[3], C. Molina[4], M. González[2]
[1]Universidad Mayor, [2]Universidad de Chile, [4]Clínica INDISA, [4]Universidad San Sebastián

Objectives Differential expression of endoplasmic reticulum (ER) stress sensors has been reported in labial salivary glands (LSG) of patients with Sjögren's syndrome (p-SS), for example ATF-6 showed a high expression that could be modulated by epigenetic mechanisms.
Objective: To determine the involvement of epigenetic mechanisms (promoter-specific DNA methylation and miRNAs) involved on the expression of ATF6α in LSG of pSS-patients and sicca controls. Also, the effect of IFN-g on both mechanisms in a 3D-acini model was evaluated.
Methods The LSG from 12 SS-patients and 10 control subjects were studied. The methylation status of ATF6 α promoter was analyzed by high resolution melting (HRM) PCR. The miRNA expression was profiled by miRNA sequencing. Bioinformatics and *in silico* analysis were performed and has-miR-424-5p was selected, because its target is the ATF6a mRNA. 3D cultures of HSG cells were incubated with IFN-γ to evaluate ATF6α expression, methylation status and the has-miR-424-5p levels. Functional assays using miRNA mimic and miRNA inhibitors were also performed.
Results LSG from SS-patients showed a significant decrease of ATF6a promoter DNA methylation (p=0.04), and hsa-miR-424-5p levels. Taqman miRNA assays validated the significant decrease of hsa-miR-424-5p levels found in LSG from SS-patients (p=0.02). Both results had negative correlation with ATF6a mRNA levels (p=0.02). Functional assays suggest that hsa-miR-424-5p regulates ATF6α mRNA levels. HSG-3D cells incubated with IFN-γ assays showed similar results.
Conclusions The DNA hypomethylation of ATF6α promoter and diminished hsa-miR-424-5p levels are involved in ATF6α overexpression reported in LSG from pSS-patients. In vitro tests showed that stimulation with IFN-γ induces hypomethylation of the ATF6α promoter and decreased hsa-miR-424-5p levels, but the mechanism is still undetermined. The recruitment of epigenetic silencing complexes in the hsa-miR-424-5p promoter cannot be ruled out.

Social Determinants Associated with Dental Caries in Adults in Chile

M. Borgeat[1], P. Carvajal[1,2], R. cuevas[5], I. Espinoza[4,2]

[1]Faculty of Dentistry, Universidad de Chile., [2]Faculty of Dentistry, Universidad de Chile., [3]Faculty of Dentistry, Universidad de Valparaíso., [4]Faculty of Dentistry, Universidad de Chile., [5]Faculty of Science, Universidad de La Serena.

Objectives To analyze the structural and intermediate social determinants measured at the individual and regional level associated with dental caries in adults in Chile.

Methods A secondary analysis of data from the 2016-2017 National Health Survey was performed. Dentate adults aged 25 and older were included. The outcome variable was having one or more cavitated untreated caries. A bivariate analysis ($p < 0.1$) and a multivariate logistic regression model, with the stepwise backward method ($p \leq 0.05$, 95% CI) and adjusted for the number of remaining teeth, were performed.

Results 6,419,862 (58.1%) of Chileans aged 25 and older have cavitated dental caries untreated. Of the individual variables, have between 35 and 44 years old (OR 1.67 95% CI 1.13 - 2.45), be male (OR 1.46 95% CI 1.14 - 1.87), and live in a household with an income below the national median household income (OR 1.68 95% CI 1.18 - 2.38) is associated with caries ($p \leq 0.01$). The only regional variable associated with caries was a Social Vulnerability and Living Conditions Index lower than the national average (OR 1.44 95% CI 1.14 - 1.82 $p \leq 0.01$).

Conclusions The prevalence of caries in adults living in regions with a Social Vulnerability and Living Conditions Index below the national average reaches 64.9%, compared to 53.9% of adults living in regions with a Social Vulnerability and Living Conditions Index higher than the national average. Of the individual variables, the one with the highest association correspond to living in a household with an income below the national median household income. None of the individual intermediary social determinants was associated with dental caries. These findings indicate the need to analyze the role that the social determinants in a regional level can have on the occurrence of caries, together with analyzing the impact of existing dental programs.

External Deforming Forces Alter Craniofacial Architecture During Development

n. morales[1], V. Toro - Ibacahe[1,3], A. Diaz[1], G. Manriquez[1], M. Bastir[2]

[1]Universidad de Chile, [2]Museo Nacional de Ciencias Naturales, [3]Max Planck Institute for Evolutionary Anthropology

Objectives The aim of this study was to compare the strength of covariation between the face and the CB (median and lateral) and to describe shape covariation patterns in individuals with and without artificial deformation of the neurocranium.

Methods Lateral cephalograms of 165 individuals were used; 99 showed either vertical (erect) or oblique deformation of the neurocranium; 66 non-deformed individuals (ND) were used as controls. Nineteen landmarks representing the facial skeleton, median and lateral CB were digitized. Using geometric morphometric tools (partial least squares analysis), we tested the null hypothesis that artificially deformed crania show the same strength of covariation and pattern between the CB (median or lateral) and the face.

Results Our results show that ND has the highest magnitude of covariation strength (high z-scores) among parts; erect deformation (ED) disrupts architectural relationships the most (i.e. lowest z-scores). ED causes an anteroposterior shortening of the median CB, which relates to a vertically oriented profile with a prominent nasal skeleton. The lateral CB, more relevant in determining facial projection, is vertically deeper in ED, which subsequently presents with a vertically oriented profile. On the other hand, oblique deformation elongates the anterior CB and projects anteriorly the lateral CB, which results in an elongated face with a prognathic maxilla. Thus, all face shapes present as expected according to lateral CB shape, but the strength of this relationship is lowered in the presence of deformation.

Conclusions These findings highlight the importance of the environmental forces in the normal development of the cranium. This knowledge is relevant for craniofacial research in dentistry and related fields, like morphology and developmental biology

Translocation of Endodontic Pathobionts through Mononuclear Blood Cells.

M. J. Bordagaray[1], M. Garrido[1,2], A. P. Hoare[3], J. Astorga[1], A. Fernández[1,4], M. Hernandez[1,5]
[1]Faculty of Dentistry, Universidad de Chile, [2]Faculty of Dentistry, Universidad de Chile, [3]Faculty of Dentistry, Universidad de Chile, [4]Faculty of Dentistry, Universidad Andrés Bello, [5]Faculty of Dentistry, Universidad de Chile

Objectives To evaluate bacterial loads of *Porphyromonas gingivalis* (*Pg*), *Porhyromonas endodontalis* (*Pe*) and total bacteria (TB) in intracanal exudates and peripheral blood mononuclear cells (PMBC) from apical periodontitis (AP) and healthy individuals.
Methods Healthy individuals with diagnosis of AP with at least one associated apical lesion and healthy volunteers consulting at Dental Clinic, Faculty of Dentistry, Universidad de Chile were included. Exclusion criteria were recent consumption of AIDs or antibiotics (3 months). Intracanal samples (n=39) were collected with sterile paper tips and transported in RTF medium and DNA was extracted by boiling method. PMBC were isolated from blood samples (n=14 per group) by Ficoll gradient and DNA was extracted using a commercial kit. The presence and number of bacterial DNA copies were measured by qPCR, using previously validated primers. The results were analyzed with software STATA V 11 ($p < 0.05$).
Results The detection of TB was positive in all intracanal samples; *Pe* and *Pg* were detected with frequencies of 41% and 20.5%, respectively. On the other hand, TB was detected in all PBMCs and bacterial load was significantly higher in AP individuals (953.6) compared to controls (300.7) ($p < 0.05$). *Pe* was detected in 50% and 64.3%, but its bacterial load tended to be higher in PA versus control PBMCs, respectively (262.3 vs 158.8; $p>0.05$). In contrast, *Pg* was not detected in PMBC.
Conclusions Higher bacterial loads can be identified in PMBC from AP compared to healthy individuals. Also DNA from the specific endodontic pathobiont *Pe* can be detected in PMBC. Accordingly, PMBC translocate specific bacteria or their DNA through circulation to distant tissue/sites and might mediate systemic responses against them.

INFLUENCE OF PLATELET-RICH FIBRIN ON PAIN AND INFLAMMATION

C. Gonzalez-Poblete, M. Vásquez, B. Schifferli
Universidad Finis Terrae

Objectives To demonstrate whether the use of Platelet-Rich Fibrin (PRF) in post-exodontic alveoli of lower third molars included, decreases the signs of post-operative pain and inflammation.
Methods Once the informed consent was signed, in a sample of 15 female patients, with extraction‘s indication of lower third molars and who comply with inclusion criterio, previously established. The patient's blood sample was taken, in 4 tubes 10 ml each, with a total of 40 ml., which were placed in a centrifuge at 1300 rpm for 8 minutes to obtain PRF. Once the exodontics of the lower third molars were performed in the same surgical procedure, under local anesthesia, prior to the suture, PRF was applied to one of the alveoli. Data collection of pain and inflammation were performed at 24 hrs, 72 hrs and one week after surgery.
Results The variable inflammation showed significant changes in the tragus-commissure points (at 24 hrs), gonion-eyes’s external angle (at 72 hrs.) And tragus-nose wing (at 24 hrs), demonstrating that there would be a decrease in inflammation with the use of PRF. Regarding the pain variable, no significant differences were shown between both groups, at any time.
Conclusions The use of platelet-rich fibrin in alveoli of lower third molar post-exodontia generated significant changes in inflammation, improving the patient's postoperative period, but not for the results obtained in pain’s area, so it is necessary to expand the size of the Sample for more conclusive results.

Cervical Spine Morphology Related to Malocclusions: A Geometric Morphometric Approach

C. Sandoval, A. Diaz, G. Manríquez
Universidad de Chile

Objectives To compare facial-craniocervical morphology between Class II and Class III individuals applying Geometric Morphometric Methods (GMM).
Methods The sample consisted in 79 lateral cephalometric radiographs of adult patients of the Dental Clinic of the University of Chile. The patients were classified according to Delaire criteria, resulting in 40 Class II and 39 Class III individuals. To assess the pattern of shape variation of cervical spine in relation to skeletal Classes II and III 13 craniofacial and 13 cervical landmarks were digitalized, and Generalized Procrustes (GPA) and Principal Component (PCA) Analyses were carried out. Differences between groups were analyzed through the corresponding thin-plate spline deformation grids.
Results The first two principal components (PC1, PC2) explained 62% of the total shape variation. The individuals were mainly separated in relation to PC1 (40%). With respect to facial morphology, differences in maxillo-mandibular sagittal relationship can be clearly observed. Additionally, craniocervical features indicate morphological differences related to a decreased cervical lordosis and an anterior inclination of the cervical spine in skeletal Class II individuals compared to the skeletal Class III ones. These differences were statistically significant (expected PC1, PC2 values= 28%, 18%, respectively; observed PC1, PC2 values= 44%, 25% respectively, after applying a Bayesian broken stick model on PC1+PC2+…+ PCn, where n=90% of the total variance).
Conclusions Despite some overlap between the skeletal classes, the morphological characteristics of the cervical spine, such as its curvature and inclination, are contributing to the observed differences between skeletal Class II and Class III malocclusions. In contrast to traditional morphometric assessment, GMM represent an effective approach to analyze visually and numerically the pattern of shape variation in the facial-craniocervical system.

Evaluation of Periodontal Parameters of a Mouthwash containing *Malva Sylvestris*

V. Llanca[1], E. Andrade[2], a. nenen[1], P. Aravena Torres[1], B. Benso[3]
[1]Universidad Austral de Chile, [2]Universidad Austral de Chile, [3]Pontificia Universidad Católica de Chile

Objectives To evaluate the clinical effectiveness of a mouthwash for based on the extract of *Malva sylvestris* to promote periodontal health using as a parameter the gingival and plaque index.
Methods A randomized clinical trial was designed and approved by the Scientific Ethics Committee of the Valdivia Hospital Health Service (ORD 181/2017). Fifty-four patients, ages between 18 and 75 years, diagnosed with gingivitis or chronic periodontitis were were divided into three groups by block randomization. Group I patients were asked to rinse with 10 ml of *M. sylvestris* mouthwash twice daily, group II with 10 ml of chlorhexidine 0,12% mouthwash twice daily, and group III with 10 ml of vehicle twice daily. The plaque index was recorded according to the O'Leary protocol (1972) and the gingival bleeding index according to Löe (1967) in the initial registry and after 7 days. The effect of each mouthwash over indexes change were analyzed (ANCOVA; $p<0.05$).
Results A statistically significant decrease was observed in the gingival index for the *M.sylvestris* group (0.04±0.12, 95% CI: 1.09-1.34;$p = 0.0104$). However, no differences were observed between the gingival index ($p = 0.73$) and the simplified oral hygiene index ($p = 0.11$) between the study groups over a period of 7 days.
Conclusions The mouthwash of *M. sylvestris* was more effective reducing the gingival index compared to chlorhexidine and the control group. The pharmacological phenomenon is associated with the anti-inflammatory capacity of the plant and its absorption in contact with oral local tissues.

Mononuclear Cell Contribution to Systemic Inflammatory Burden in Apical Periodontitis

J. Astorga[1], A. Fernández[2,1], M. Garrido[3], P. Gebicke-Haerter[4], C. M. Jiménez[2,5], A. Chaparro[6], M. Hernandez[1,7]
[1]Faculty of Dentistry, Universidad de Chile, [2]Faculty of Dentistry, Universidad Andrés Bello, [3]Faculty of Dentistry, Universidad de Chile, [4]Faculty of Medicine, Universidad de Chile, [5]Pontificia Universidad Católica, [6]Faculty of Dentistry, Universidad de los Andes, [7]Faculty of Dentistry, Universidad de Chile

Objectives To evaluate the contribution of peripheral blood mononuclear cells (PBMC)-derived cytokines and TLR-2 gene regulation to systemic inflammatory burden in apical periodontitis (AP).
Methods Blood samples from otherwise healthy individuals with AP (n=20) and controls with no AP (n=20) were collected at the Dental Clinic, Faculty of Dentistry, Universidad de Chile. PBMC were isolated by Ficoll gradient and DNA and RNA extracted. The RNA was converted to cDNA and TLR2 gene expression was determined by qPCR. The DNA was subjected to bisulfite conversion and amplified with qPCR with validated primers for bisulfite-treated DNA. The PCR products were sequenced, analyzed with BiQanalyzer and methylation profiles determined. A PBMC fraction was cultured for 24 hours in serum-free RPMI and supernatants were collected and IL-1β, TNF-α, IL-6, IL-6 Rα, IL-10 and IL-12p70 protein levels were determined through quantitative multiplex assay. Systemic inflammation was defined by hsCRP levels in serum, measured by turbidimetric method. Results were analyzed with and Stata V 12, $\alpha = 0.05$.
Results PBMC from patients with AP showed higher secreted levels of IL-1β, IL-6 and TNF-α ($p<0.05$) and a slight overexpression of TLR-2 mRNA levels. CpG island on TLR-2 gene was hypomethylated (16% vs 21%, respectively; $p<0.05$), as well as specific CpG dinucleotides localized in -77, -69, -16, -12, and -8 (NFκB) sites in controls versus AP. hsCRP was significantly higher in AP vs control individuals (2.54 and 0.74 respectively) in bivariate analysis. Multivariate analysis controlling for imbalanced variables (age, smoking and DMTF index) showed that PBMC-derived IL-1β was the main predictor for serum hsCRP levels (R-squared 0.5629, $p<0.05$).
Conclusions PBMC from patients with AP exhibited a pro-inflammatory profile compared to healthy controls, with no evident association to TLR2 regulation. Particularly PBMC-derived IL-1β explained serum elevations of hsCRP.

RELATIONSHIP BETWEEN SUPERIOR CENTRAL INCISIVES FORM AND FACIAL INDEX

C. Gonzalez-Poblete, I. Paredes, N. Scarzella
Universidad Finis Terrae

Objectives To determine the parameters of the upper central incisor (UCI) in relation to the Facial Index in a population of young people and adults of the Faculty of Dentistry of Finis Terrae University.
Methods Volunteers who comply with the inclusion criteria previously established were recruited. Once the informed consent was signed, a brief survey was completed. Each patient had two direct facial measurements, with a vernier caliper, to obtain the facial index. The same was done in the upper right central incisor, where the maximum width and length of the latter was measured, with a compass.
The data obtained through the descriptive analysis will be poured into a collection form, through the Excel program and they were statistically processed using the SPSS 11.5 statistical system. After this, the relationship between the upper right central incisor and the facial index was estimated using the Chi-square statistic.
Results The total sample was divided into 3 age groups: Group 1: from 20 to 29 years old, Group 2: from 30 to 49 years old and Group 3: ≥ 50 years old, with an average of 40.5 ± 15.2 years. The total average of the upper central incisors size was 86.6 ± 12.3 which indicates an Ovoid shape and the average of the total facial proportion was 96.5 ± 11.2 which corresponds to Euryprosopic. In the group 1, euryprosopic, mesoprosopic and leptoprosopic had a greater relationship with the ovoid form of the ICS. However, there is no association between dental form and facial form in this group. In the group 2, it is shown that the Ovoid form is the most prevalent as same as Euryprosopic form. A relationship between dental form and facial form is not observed. In the group 3, there could be an association between the facial form and dental form, and in this case the square and ovoid form are the most common, obtaining the same number of people for these two ways.
Conclusions According to this study we can conclude that there is a relationship between the form of UCI and the Facial Index. This could serve as a parameter to select the UCI. According to these results there is a significant correlation between the form of the teeth and faces shape, but should not be used uniquely to make removable prostheses or complex restorations in the anterior sector, this could give unsatisfactory results.

Evaluation Of Probiotic Cheese With *Lactobacillus Casei*-01 In Experimental Periodontitis

B. Pirovani[2], A. P. Hernandes[2], P. F. Silva[1], A. G. da Cruz[1], F. C. Furlaneto[1], M. R. Messora[1], M. H. Nagata[2]
[1]USP, [2]UNESP

Objectives The aim of this study was to evaluate the effects of a functional food intake, Prato cheese with Lactobacillus casei - 01 in experimental periodontitis (EP) in rats.
Methods Sixty-six male rats (*Rattus norvegicus, albinus*, Wistar) were divided into 6 groups: C (control): animals without EP induction and fed with conventional feed only (CF); C-EP: animals with EP induction and fed with CF only; CONV: animals without EP induction and fed with conventional cheese + CF; CONV-EP: animals with EP induction and fed with conventional cheese + CF; PROB: animals without EP induction and fed with probiotic cheese + CF; and PROB-EP: animals with EP induction and fed with probiotic cheese + CF. On day 0, either conventional or probiotic cheese was orally administered according to the experimental group (10 g/day/rat) until the end of the experiment. At day 28, EP was induced in the right mandibular first molar of the animals of the C-EP, CONV-EP and PROB-EP groups. On day 42, all animals were euthanized. Microtomographic analysis was performed for assessment of alveolar bone loss.
Results The PROB-EP group had a higher ($p < 0.05$) bone volume in the bifurcation when compared to the C-EP group (73% ± 13.96 and 55% ± 13.44, respectively). Higher bone volume ($p < 0.05$) was observed in the bifurcation in the CONV-EP group when compared to the C-EP group (80% ± 4.15 and 55% ± 13.4, respectively).
Conclusions Within the limits of this study, it can be concluded that daily consumption of probiotic cheese played a protective role against alveolar bone loss in EP. The results also suggested that regular consumption of conventional Prato cheese may minimize the effects of EP.

Clinical performance class I bulk-fill composites: 9 months follow-up

I. Molina Muñoz, T. Vergara, J. Carrion, C. Saez, j. Pizarro, J. Nakouzi
Universidad Andres Bello

Objectives Compare to 9-month follow-up of clinical performance in occlusal restorations with two Bulk- Fill composite and nanofilled composite by FDI criteria.
Methods 48 voluntary patients, with 3 occlusal caries lesions in posterior teeth. The depths of the lesions were between 2.5mm-4.0mm with antagonist teeth. Were distributed randomly: Group TB: 48 Resins Bulkfill Tetric N-Ceram (Ivoclar Vivadent), Group FB: 48 restorations Filtek Bulkfill (3M-Espe) and Group control Z350: 48 restorations Filtek Z350 (3M-Espe). The restorative procedure was done with anesthesia and absolute isolation. All cavities were conditioned in enamel for 20 seconds with 37% phosphoric acid and then rinsed, dried and applied adhesive Single Bond Universal (3M-Espe) in cavities of groups FB and Z350, while in the cavities of the TB group was applied adhesive AdheSE Bond Universal (Ivoclar-Vivadent) according manufactures instructions The TB and FB restorations were done with an only layer (maximum deep 4mm) and Z350 was restored with 2 mm deep multilayer. Restorations were polymerized for 30 seconds with a Bluephase light-curing unit (Ivoclar-Vivadent) with intensity of 1.100mW/cm2. Calibrated operator (Kappa>0.8) evaluated the restorations by FDI criteria, adaptation (A), sensibility (S), surface lustre (SL) marginal staining (MS) and caries (C) of the 9-month later. For the statistical analysis of the information software SPSS 21.0 with the Friedman test was used (95 %level of significance).
Results For 9 month follow-up were evaluated 42 patients (N=126). All restorations were present and were not C neither S. There was score 1 for: A 98%(41) in Z350, FB and 100%(42) TB; SL there was 90%(38), 93%(39) FB and 95%(40) TB; MS 93%(39) Z350, 95%(40) and 100%(42) TB. There was not significant difference between the groups ($p >0.05$).
Conclusions The two bulk-filled composite-resin restorations oclusal had not significant difference in 9-month follow-up performance compared with the nanofilled control restorations evaluated by FDI.

Analysis of the masticatory function in subjects with different BMI.

C. Venegas, N. Farfán, R. Fuentes
Universidad de La Frontera

Objectives The objective of this study was to evaluate the masticatory function of the superficial muscles of mastication by using surface electromyography (sEMG), kinematic characteristics and Maximum Functional Bite Force (MFBF) in subjects with different Body Mass Index (BMIs).
Methods A cross-sectional observational study was carried out. The BMI evaluation was made with a Health O' Meter®. Ten participants aged 24 ± 3.8 years were classified in two groups: Five were Normal (18.5-24.9) and Five were Obese (≥30), The Chewing evaluation was performed by using Electromagnetic Articulograph(EMA), all the patients were asked to chew 3.7 g of peanuts (3 repetitions). MFBF was evaluated with GM10 Occlusal Force Sensor and the electromyographic activity of the masticatory muscles was assessed with sEMG.
Results In the kinematic characteristics of chewing evaluation (Table 1), no significant differences were found between groups. MFBF and electromyographic activity for each group were described in Table 2. Significant differences were found when comparing EMG activity in the right temporalis muscle in both groups (p= 0.03). The MFBF mean was correlated with the masticatory frequency, with a weak positive correlation in the normal group (0.100) and a weak negative correlation for the obese group (-0.200). The correlation between MFBF with chewing speed was null in the normal group (0.000). However, a weak positive correlation was found in the obese group (0.300).
Conclusions Our results are inconclusive regarding the kinematic characteristics of chewing and MFBF in the groups. The normal group presented greater electromyographic activity than the obese group in all the muscles analyzed, this means that a higher value BMI, lower is the electromyographic activity that is registred. In order to continue this study, a higher sample is needed to determine significant differences between groups.

Table 1: Chew kinematics according to BMI.

	Cycles Number (Mean± SD)	Frequency (mean ± SD, cycles/min)	Cycle Area (mean ± SD, mm2)			Speed (mean ± SD, m/s)	
			Frontal	Sagittal	Horizontal	Ascent	Decline
BMI (18,5-24,9)	25,67 ± 9,20	84,00 ± 15,13	34,94 ± 14,88	13,62 ± 6,84	7,58 ± 4,84	56,26 ± 10,68	57,12 ± 12,20
BMI (≥30)	23,07 ± 11,73	78,00 ± 28,26	38,73 ± 21,49	16,68 ± 8,87	13,08 ± 13,57	59,45 ± 11,57	56,15 ± 6,72
P value	0.841	0.999	0.841	0.690	0.548	0.690	0.841

Table 2: MFBF and sEMG behavior per side, according to BMI.

	MFBF (mean ± SD, N)				Electromyography (mean ± SD, μV)			
	Right		Left		Right		Left	
	Molar	Premolar	Molar	Premolar	Masseter muscle	Temporalis muscle	Masseter muscle	Temporalis muscle
BMI (18,5-24,9)	448,8 ± 142,7	277,4 ± 89,1	455,6 ± 242,3	239,2 ± 113,1	5,90-05 ± 3,25-05	6,53-05 ± 4,94-05	6,85-05 ± 3,19-05	7,85-05 ± 5,87-05
BMI (≥30)	380,6 ± 214,6	291,1 ± 263,9	438,6 ± 207,3	267,8 ± 186,5	4,80-05 ± 2,82-05	3,37-05 ± 3,00-05	5,72-05 ± 3,95-05	4,28-05 ± 2,76-05
P value	0.548	0.421	0.690	0.690	0.547	0.030	0.221	0.068

Analysis of Biocompatibility of Bioceramic Cements on CD4+Tcells

s. v. castro[1,2], B. Antilef[1], M. A. Fraga[1], C. Osbén[2], G. Sánchez-Sanhueza[2], E. Nova-Lamperti[1]
[1]Department of Clinical Biochemistry and Immunology, School of Pharmacy, University of Concepcion, [2]University of Concepcion

Objectives The aim of this study was to evaluate the effect of Bioceramic cements on proliferation, viability and cytokine secretion of polyclonal activated CD4+Tcells.
Methods Bioceramic cements are recently-developed endodontic cements that exhibit several bioactive characteristics and improved biocompatibility in comparison with widely used resin-based cements. However, up to date, there are no studies aimed atevaluatingtheir biocompatibility and bioactivity on human CD4+Tcells. Bioceramic cements Total Fill Putty, Biodentine, Total Fill Sealer, Bioroot-RCS and resin-based cement Top Seal were prepared according to manufacturer of instructions under sterile conditions. After preparation, cement extracts were obtained after incubating 3.5x1.5mm disc cement in 1ml of RPMI for 7 days at 37°C. Next, cement extracts were span at 3.500rpm, filtered with 0.45um and stored at -80°C for further use. Human CD4+ T cells were isolated from oral tissue biopsies using cell sorting and expanded with aCD3CD28 beads. Then, CD4+T cells were cultured with or without each cement extract (25%v/v) for 5 days. Proliferation, viability and cytokine secretion were assessed using Cell Trace Violet, Live-dead dye and Cytokine Bead Array, respectively. Samples were acquired on a FortessaX20 and analyzed with FlowJo.
Results Our data showed that in terms of viability, the extract of Total Fill Putty did not affect the viability of CD4+Tcells, whereas Biodentine, Total Fill Sealer and Bioroot-RCS reduced percentages and numbers of cells. Top Seal was the most cytotoxic cement, inducing a drastic reduction of live cells. On the other hand, proliferation rates were not affected in the remaining live CD4+Tcells cultured with cement extracts. Finally, cytokine secretion was compared between CD4+Tcells alone or in the presence of Total Fill Putty and the data revealed that the production of cytokines was affected by the presence of the former cement extract.
Conclusions Our data demonstrated differences in biocompatibility between Bioceramic cements on CD4+Tcells cells.

Evaluation of the effects of low intensity laser on osseointegration of implants with different surfaces

L. K. de Jesus, A. Piquera Santos, L. T. Colombo, H. Hadad, F. Ávila Souza
São Paulo State University (UNESP), School of Dentistry, Araçatuba

Objectives The aim of the present study was to evaluate the effects of low intensity laser on the osseointegration process in implants manufactured in Ti-6Al-4V alloy with surface machined (MS) and modified by aluminum oxide blasting followed by acid etching (SBAS), installed in rabbit tibias.
Methods Twenty Albinus rabbits received 40 external hexagon implant (4mmx10mm) in surgical beds milled in the medial portion of the right and left tibias, and one implant of each surface was randomly installed. The animals were divided into two groups: Group I - animals that did not receive laser therapy and Group II - animals that received laser therapy. After each implant was installed, its stability coefficient was measured by resonance frequency analysis (ISQ). At 21 and 42 days, the implant stability coefficient (ISQ) was measured again, followed by biomechanical analysis by means of removal torque. Data were submitted to analysis of variance and Tukey t test.
Results The resonance frequency measurements showed no statistically significant differences ($p < 0.05$) between the groups in the analyzed periods. However, Group II removal torque measurements were statistically higher ($p < 0.05$) when compared to Group I at 21 and 42 days.
Conclusions In view of the results obtained, it can be concluded that the low intensity laser accelerated the early phases of the osseointegration process, allowing higher removal torque values when compared to implants installed without the low intensity laser.

Criteria for Referral of Pregnant Women to The Periodontics Specialty

D. Quezada[1], J. Rodríguez[1], D. Reinero[1], C. Carvajal[2], P. Carvajal[3]
[1]Faculty of Dentistry, Universidad de Chile., [2]Ministry of health, [3]Faculty of Dentistry, Universidad de Chile.

Objectives To know the criteria for referral to the periodontics specialty used by dentists who care for pregnant women in Primary Health Care (PHC).
Methods Cross-sectional and descriptive study. A questionnaire was electronically sent to PHC dentists belong to the 29 Health Services who attended pregnant women during 2018 to investigate about the criteria for referral to the periodontists. Their participation were voluntary and anonymous. Data were transferred to an Excel spreadsheet and description was made using absolute and relative frequency.
Results 522 dentists (57.5% of women and 42.5% of men), with an average age of 32 years, belong to the 29 Health Services of the country answered completely the questionnaire. The presence of probing depth, tooth mobility, bone loss and clinical attachment loss are mainly mentioned as criteria for referral to the periodontics specialty. 64.6% of them sometimes use the basic periodontal exam (BPE), but only 29.4% mentioned it as a referral criterion, although 87.2% considered it a useful tool in the clinic. In addition, only 9% of them know the recommendation of the Clinical Guide of the Ministry of Health to derive through the result of the EPB.
Conclusions PHC dentists use mainly as a criterion to refer to the periodontics specialty late signs of periodontal destruction. It is necessary to strengthen the examination training in periodontal tissues to give every pregnant woman early diagnosis and timely treatment.

Integrative analysis of DNA global methylation in Sjögren's syndrome

C. Lagos[2], S. M. González[1], P. Carvajal[2], I. Castro[2], D. Jara[2], S. Aguilera[3], C. Molina[4], M. Barrera[4], M. González[2]
[1]Universidad Mayor, [2]Universidad de Chile, [4]Clínica INDISA, [4]Universidad San Sebatián

Objectives A global DNA hypomethylation has been previously reported in Sjögren's syndrome (SS)-patients. DNA methylation is a dynamic process, where cytosines are methylated (5mC) by DNMTs and hydroxymethylated (5hmC) by TETs enzymes. Pro-inflammatory cytokines are known to induce changes in methylation process.
Objective: To determine global levels of DNA methylation (5mC), demethylation (5hmC), and DNMT TET enzymes in salivary glands (SG) from SS-patients. Additionally, to evaluate cytokine effects on global DNA methylation in human SG cells.
Methods Labial SG from 23 SS-patients, 15 controls, and 3D-acini stimulated with TNF-a or IFN-g (1 or 10 ng/mL) were analyzed. 5mC, 5hmC, DNMTs and TET2 levels were assessed by immunofluorescence, quantified independently in epithelial and inflammatory cells, and correlated with focus score. mRNA levels of DNMTs and TETs were determined by RT-qPCR.

Results SS-patients and cytokine stimulated 3D acini showed significant increase of DNA hydroxymethylation and decrease of DNA methylation. Their 5hmC and 5mC levels correlated positively and inversely with focus score, respectively. A significant increase in mRNA levels of DNMT1, DNMT3a, and TET2 and a significant decrease of TET1 and TET3 was observed. Assays performed in cytokine stimulated 3D acini showed similar results.
Conclusions Pro-inflammatory cytokines increase global DNA hydroxymethylation and decrease DNA methylation in SG epithelial cells, probably inducing TET2 expression. High DNMTs protein levels reported in inflammatory cells are consistent with high levels of 5mC suggesting that increased DNMTs transcript levels in LSG from SS-patients are produced in inflammatory cells. Changes of DNA hydroxymethylation could have an etiopathogenic role in Sjögren's syndrome.

Effect of Osseodensification on Primary stability, Insertion and Removal Torque
C. A. Troncoso, R. Silva, N. Pinto
Universidad de los Andes

Objectives To determine the effect of Oseodensification on insertion torque, RFA and removal torque
Methods 50 osteotomies were performed in pig tibiae to install dental implants using the standar protocol and 50 to install similar implants using Oseodensification technique
Results insertion torque, ISQ value and removal torque were significantly higher ($p \leq 0.05$) for the experimental compared to the control group
Conclusions osseodensification protocol obtains statistically significant higher values for the insertion torque, ISQ value and removal torque associated with the installation of implants in low-density bone compared to the conventional milling protocol.

	Control Group (n1:50)	Experimental Group (n2:50)
Insertion Torque	Ncm	Ncm
Media	27,59	39,82
Mean	20	24
Max	57	91
ISQ		
Media	68,89	71,69
Mean	59,75	64,5
Max	79,25	79
Removal Torque	Ncm	Ncm
Media	27,88	38,95
Mean	20	22
Max	68	89

Clinical Evidence of Periodontal Stability with Orthodontic Treatment in Patients with Reduced Periodontium

C. Naranjo Godoy[2], R. Riquelme Muñoz[3], C. Navarrete Contreras[4], A. Riquelme Hormazábal[1], M. A. Michea Rivera[1], H. vonMüllenbrock Evangelista[4], C. Kuzmanic Coddou[1], V. Guerrero Uzcategui[1], J. Venegas Pereira[1], C. González Opazo[4]

[1]Facultad de Odontología Universidad de Chile, [2]Servicio de Salud del Reloncaví, [3]Practica Privada, [4]Facultad de Odontología Universidad de Chile

Objectives To determine the changes in periodontal clinical parameters in patients with reduced periodontium and pathological tooth migration under a specific orthodontic protocol.

Methods An experimental study of uncontrolled clinical trial type, of follow-up was carried out. Sample of 16 patients with periodontal discharge, pathological tooth migration and periodontal support therapy. Orthodontic treatment was performed with bracket cementation according to the remaining bone level using light and intermittent forces. The periodontal clinical parameters were recorded on probing depth, gingival recession, clinical insertion level, plaque index and bleeding on probing at the time of periodontal discharge (t0) and 18 months after orthodontic treatment (t1) started by the same clinician previously calibrated.

Results There is no difference on probing depth between t0 and t1 ($p>0.05$). There are differences in gingival recession and clinical insertion level ($p<0.05$), but without clinical significance (≤1mm). There is an increase in dental biofilm and a decrease in bleeding on probing in t1.

Conclusions The periodontal parameters of probing depth, gingival recession, clinical insertion level and bleeding of probing of patients with pathological dental migration and reduced periodontium present a minor clinical change during orthodontic treatment under a specific protocol, maintaining the periodontal stability obtained at the time of periodontal discharge. The periodontal treatment and periodontal support therapy is a requirement for performing orthodontic treatment. Dental biofilm control should be more cautious during orthodontic treatment as it increases at 18 months.

Systemic Inflammatory Burden of *Porphyromonas* spp. in Apical Periodontitis.

C. M. Jiménez[1,2], M. Garrido[4], J. Astorga[1], P. J. Pussinen[3], A. Chaparro[4], M. Hernandez[1,5]

[1]Universidad de Chile, [2]Universidad Andrés Bello, [3]University of Helsinki, [4]Universidad de Chile, [5]Universidad de Chile, [6]Universidad de los Andes

Objectives To evaluate the systemic inflammatory burden to *Porphyromonas (P) gingivalis and endodontalis* in young adults with Apical Periodontitis (AP).

Methods Clinical intraoral examinations were performed and serum samples from 39 patients with AP and 40 healthy controls were obtained from volunteering individuals ≤ 40 years consulting at the Dental Clinic of the Faculty of Dentistry of Universidad de Chile. Serum levels of hsCRP and specific anti- P. gingivalis and P. endodontalis IgA and IgG antibodies were evaluated by ELISA assay. Intracanal tooth samples from 36/39 of the patients with AP were obtained using sterile paper-points and presence P. gingivalis and P. endodontalis was evaluated by conventional PCR. Intraoral covariates were registered. Results were analyzed in STATA V12 using Mann-Whitney, Chi-square tests and multiple regression models ($\alpha=0.05$).

Results Serum concentrations of hsCRP and anti-*Porphyromonas* IgG and IgA tended to be higher in AP patients nonetheless, differences with controls were only significant for hsCRP and Pe-IgG ($P<0.02$). A multivariate analysis was performed: aside from AP diagnosis ($P=0.03$), neither age nor any of the oral parameters influenced in Pe-IgG serum concentrations ($P>0.2$). Within the AP group, *P. endodontalis* and *P. gingivalis* were detected in 33.3% and 22.86% of patients, respectively. Patients with positive bacterial-detection tended to have higher immunoglobulin levels nonetheless, differences were non-significant when compared with AP patients with negative bacterial-detection.

Conclusions Young adults with AP evidenced elevated serum levels of anti-P. endodontalis-IgG and hsCRP. Intracanal P. endodontalis and P. gingivalis accounted for almost one third of AP in young adults.

Inmediate Perfomance BulkFill Self-etch Versus Selective Etch With Universal Adhesive

M. Liberona Salinas, P. Villalobos, P. Vildosola, J. Nakouzi, C. Conejeros
Universidad Andrés Bello

Objectives Compare the immediate clinical performance in posterior restorations with Bulk- Fill composites performed with self-etch mode and selective etching mode with the same universal adhesive.
Methods 36 patients with at least 3 occlusal or proximal caries lesions in posterior teeth with antagonist. The depths of the lesions were between 2.5mm-4.0mm and with proximal teeth. The groups were distributed randomly: Group EB: 36 restorations Filtek Bulkfill (3M-Espe) mode selective etching Group TE: 36 restorations mode total self-etch and Group control Z350: 36 restorations Filtek Z350 selective etch. The restorative procedure was done with absolute isolation. Z350 and EB were conditioned in enamel for 20 seconds with 37% phosphoric acid and then rinsed, dried and applied. Group TE Was not etching. For three gropus was used Adhesive Single Bond Universal (3M-Espe). according to manufacturer's. The EB and TE restorations were done with an only layer (maximum deep of 4 mm) and Z350 were restored with 2 mm deep multilayer. Restorations were polymerized for 30 seconds with a Bluephase N light-curing unit (Ivoclar-Vivadent) with intensity of 1.100mW/cm2. Calibrated operator (Kappa>0.8) evaluated the restorations by FDI criteria: marginal staining (MS) and marginal adaptation (MA), fracture and retention (FR), surface luster (SL), anatomy (A), color (C) and postoperative sensibility (PS) two weeks later. The Friedman test was used for the statistical analysis. (95% level of significance).
Results For follow-up 36 patients were evaluated (N=108). For the three groups all parameters were evaluated score 1. There were not significant differences between the groups ($p>0.05$).
Conclusions For the two groups bulkfill with different etching mode and group control composite-resin restorations there were not significant differences in the immediate performance according to FDI criteria.

Mandibular Rest Position Analyzed Through 3D Electromagnetic Articulography. Pilot Study.

C. Martinez Salas[1], E. Elgueta[1], F. Lezcano[2], G. Alvarez[2], R. Fuentes[2]
[1]Universidad De La Frontera , [2]Universidad De La Frontera

Objectives The aim of this study is to determine the linear and angular displacement described by the mandible when applying different methods to reach rest position, employing 3D electromagnetic articulography.
Methods Three-dymensional electromagnetic articulography (EMA 3D) was employed to register the position of the mandible of a young healthy volunteer (Ethics Committee Approval 080_18). Three reference sensors were glued on glabella, right and left mastoids in order to eliminate head movements from the recordings. Another three reference sensors were used to determine the position of the occlusal plane. Three active sensors were placed on the mandible: on the inter-incisive mid-line, on the midline between first molar and premolar on the right and left sides. The position of each active sensor was recorded during position of maximal intercuspation (MIC) and rest position (RP). Rest position was achieved through different methods: "No Command", "Swallowing", "Mississippi" and "M Phoneme". The linear and angular displacement of each sensor from MIC to each RP was calculated employing custom developed Matlab Scripts.
Results The maximum displacement was observed in the position achieved by the "No Command" method, with a linear displacement of 1.4 ± 1.0 mm and an angular displacement of 1.4 ± 0.6 grads. The minimum displacement was observed in the position achieved by the "Swallowing" method, with a linear displacement of 1.2 ± 0.5 mm and an angular displacement of 0.5 ± 0.4 grads. The higher standard deviation was observed for the "No Command" method and the lower for the "Swallowing" method.
Conclusions The proposed methodology could be used to analyze the rest position of the mandible with high precision (0.3 mm). In the future, we expect to analyze the variability of the different methods employed to reach RP, recruiting a relevant number of participants, in order to determine which method is more reliable.

Local–Systemic Treatments for Stability of Orthodontic Miniscrews: Systematic Review

V. A. Román[1], K. Y. Yagnam[1], N. M. Abdala[1], C. A. Tapia[2], I. Rozas[1]
[1]Universidad del Desarrollo, [2]Universidad Diego Portales

Objectives The objective of this systematic review is to identify in the current literature the local and systemic treatments that improve the stability of the miniscrews in orthodontics.
Methods This systematic review was carried out under the PRISMA criteria. A systematic search was conducted in the electronic databases of Cochrane, Pubmed, Tripdatabase, EBSCO and Epistemonikos until February 2019. The inclusion criteria of the studies were: use of miniscrews in orthodontics with local or systemic treatment, in vivo experiments in humans and animals, including randomized and non-randomized clinical trials; and exclusion criteria: clinical trial protocols, case reports, systematic reviews, topical or systemic treatments in dental implants and surface treatments of the miniscrew. The risk of individual bias of the publications found was evaluated using the tools: RoB2, Syrcle and RoBANS.
Results Of a total of 935 results, 8 approved the inclusion requirements. A low risk of individual bias was identified in most of them. It was not possible to perform a meta-analysis due to the heterogeneity of the included studies. Five studies were found in animals and three in humans, with different treatments: Low level laser therapy (LLLT), Low intensity pulsed ultrasound (LIPUS), Platelet-Released growth factor (PRGF), Light emitting diode mediated photobiomodulation (LPT), Antibiotic prophylaxis and Zoledronate.
Conclusions It was found a weak scientific evidence regarding the treatments that influence the stability of the miniscrews. The LLLT, LIPUS, PRG and LPT therapies showed an increase in the stability of the miniscrews, on the other hand, antibiotic prophylaxis did not show an improvement. More studies are needed to apply these treatments in randomized clinical trials in humans.

Risk Factors and Etiology for Temporomandibular Joint Osteoarthritis. A Systematic Review

A. Jimenez-Silva[1], S. Vivanco-Coke[3], J. Flores-Ramos[4], E. Becerril-Álvarez[5], R. Bahamondes-Melo[6], C. Beltrán-Devaud[7], R. E. Frugone-Zambra[2]
[1]Universidad Andrés Bello, [2]Universidad de La Serena, [3]Universidad de Chile, [4]Universidad Autónoma de Nayarit, [5]Universidad de los Andes, [6]Universidad Mayor, [7]Universidad Autónoma de Chile

Objectives The aim of this study was to assess the risk factors and etiology for temporomandibular joint osteoarthritis (TMJ-OA).
Methods A systematic research was performed on electronic databases in PubMed, Cochrane Library, Embase-Medline, EBSCOhost, Scopus, Scielo, Bireme, Lilacs, ScienceDirect between 1960 and 2018, including all languages. Observational analytical studies were identified. The data were collected and extracted by two independent authors. The methodology of selected studies was assessed by The Grading of Recommendations Assessment Tool, Development and Evaluation (GRADE) and Newcastle-Ottawa Scale (NOS).
Results 6926 records were identified and only 22 were analyzed. 1 cohort and 21 case-control studies were identified. Quality of evidence was low due to high risk of bias according to GRADE assessment and none of the reviewed articles obtained the highest score based on NOS scale, with an average of 4.68 an a median of 5 points. 16 articles stablished risk factors for TMJ-OA being grouped according to type of risk factor in: DDwoR or ADD (n=5); Bone marrow edema (n=2); Missing posterior teeth (n=1); Asymmetric molar or canine Angle classes (n=1); 1607 1G/2G polymorphism of the MMP-1 (n=1); greater condylar angle (n= 1); Low condylar bone quality (n=1); Allergy (n=1); Wind instruments (n=1); GDF5, SMAD3 and RUNX2 polymorphisms (n=1) and Matrilin-3 gene polymorhism (n=1).Risk of development TMJ-OA increased in patients with DDwoR and those who have greater condylar angle of the studies that determined it, had a better methodological quality.
Conclusions The evidence available is insufficient to establish definitive conclusions, since the studies were very heterogeneous and presented a high risk of bias. To establish the etiology of TMJ-OA requires cohort and high-quality studies. However, DDwoR and greater condylar angle seems to be an important etiologic factor to developement of TMJ-OA.

Study of the Skull / Face Ratio in Different Types of Skeletal Patterns

a. s. Ogalde
Universidad de Concepcion

Objectives To evaluate the Skull/Face ratio in the different types of skeletal patterns according to Miralles
Methods The lateral radiographs of 50 individuals were studied, all students of the University of Concepción With an age range of 18 to 22 years. From the lateral teleradiography, the SNA, SNB, ANB, GoGn-SN angles and head, skull and face areas were measured. The skeletal structure (Normo, n= 25, Mesio = 8, Disto n= 17) was determined according to Miralles. All individuals were informed of the Helsinki protocol. Statistical analysis was performed using ANOVA
Results Skull/Face ratio according to miralles Area $cm^{2+/-}$ se (standart error) Normo (n=25) Head area=288,20+/- 4,2; Skull area=211,73+/-3,0; Face area=76,46+/-1,8; Ratio Skull/Face=2,79+/-0,6. Mesio (n=8)Head area=285,92+/- 9,7; Skull area=201,21+/-7,1; Face area=84,70+/-3,8*; Ratio Skull/Face=2,39+/ 0,1*. Disto (n017)Head area=280,34+/-6,3; Skull area=206,46+/-5,1; Face area=73,87+/-2,5; Ratio Skull/Face=2,83+/-0,1 * p< 0,05
Conclusions In the different skeletal patterns, the Mesio group presents significant differences in the Skull/Face ratio with class I and class II skeletal pattern according to Miralles. This indicates that class III individuals present a larger face area compared to class I and II, at the expense of greater mandibular growth, which entails greater work to maintain posture.

GES for Oral-Health: Structural Changes and Decisions in Health Reform

M. D. Durán
Universidad San Sebastián

Objectives To analyze the evolution of oral health actions guaranteed in the regime of explicit health guarantees (GES) since its implementation
Methods Review of the decrees of law that govern the regime of explicit guarantees since 2005, and the public minutes of the GES advisory council (available on the website of the Ministry of Health). Eleven decrees were reviewed, and all Council minutes, published from 2005 to 2013 (n = 56)
Results Since 2005 to date there are 4 GES that are directly related to actions of comprehensive oral care. These were gradually integrated into the decrees of 2005 (Comprehensive Oral Health for 6-year-old children), 2007 (Comprehensive Oral Health for 60-year-old adults and Outpatient Dental Emergency) and in 2010 (Comprehensive Oral Health for the pregnant woman). The specific actions guaranteed have modifications for children of 6 years, reducing the pathologies included and including the risk approach only in 2013. The opportunity guarantee, which indicates the maximum time for compliance with the actions, has undergone modifications for the population of 6 years with a reduction of the term for the beginning of the treatment, and for pregnant women extending the time to conclude it. None of the oral health guarantees are discussed in the GES advisory board and the changes have no justification for public access. It is detected that, during the discussions of the council, decisions are made through unofficial means, without respecting the good practices of transparency of decision making.
Conclusions No justifications for the modifications of the GES were detected. There are deficiencies in the transparency of the decision process of the GES and specifically for oral health.

Effect of acid etching pre-treatment of enamel on the microleakage using a universal adhesive

M. J. Atenas[2], S. Mujica Cisternas[2], D. Aizencop[2], A. Nuñez[3], M. L. Méndez Bauer[4], M. F. Gutierrez Reyes[1,2]
[1]University of Chile, [2]Universidad Finis Terrae, [3]State University of Ponta Grossa, [4]State University of Ponta Grossa

Objectives To evaluate quantitatively the marginal microleakage of Class II restorations carried out with universal adhesives with or without prior phosphoric enamel acid etching, subjected to thermal cycling.
Methods Eighty-eigth Class II cavities were prepared at the proximal surface of human third molars and randomly divided according to the following variables: (i) with or without prior etching of the enamel; (ii) thermal cycling [5,000; 10,000 and 15,000 cycles]; and (iii) staining: methylene blue and silver nitrate. The Class II cavities were restored with a universal adhesive [ScotchBond Universal adhesive] with or without prior etching of the enamel, and resin composite [Bulk Fill Posterior] and light-cured using a LED unit. After restorative procedure and thermocycling, the specimens were immersed in methylene blue or silver nitrate for 24h. After that, the specimens were sectioned with a cutting machine with a diamond blade. The teeth were observed in a 100x magnifying stereoscopic magnifying glass and evaluated in occlusal and cervical area. Data were statistically analyzed by 2-way ANOVA (α=0.05).
Results For methylene blue and silver nitrate, the prior etching of the enamel showed lower values of microleakage when compared with the non-etching group, for all thermal-cycles. In addition, the cervical microleakage showed higher values when compared with occlusal microleakage, for all thermal-cycles. Moreover, 15,000 thermal cycles generate more microleakage when compared with 5,000 thermal cycles, for all groups
Conclusions The use of acid etching prior to universal adhesives used in self-etch mode improve the performance of Class II resin restorations, reducing the microleakage in occlusal and cervical area.

Variation Pattern Of Mesiodistal Dimension Of Mandibular Molars

T. A. París Gaete[1], G. Manríquez[1,2], L. Araneda[1], A. Diaz[1]
[1]Universidad de Chile, [2]Facultad de Ciencias Sociales, Universidad de Chile

Objectives Through evolution, humans have experienced changes in the maxillofacial territory. The teeth, specifically, have undergone changes in the proportions of the elements that constitute them, also decrease in size and delay in the chronology of the eruption.
According to a previous landmark study, the dimension of the teeth of different populations of hominids, it is concluded that in the permanent dentition and from the first mandibular molar, there is an inhibitory gradient towards distal, which is expressed as a gradual decrease of size between this tooth and the third molar.
The purpose of this study is to know if, in permanent mandibular molars of a Chilean sample, there is a pattern of reduction of mesiodistal length to distal.
Methods Using the TpsDig2 software, mesiodistal length of the crowns of the first, second and third mandibular molars were measured from images of panoramic radiographs of 100 people. The data were statistically analyzed using the PAST software (3.21).
Results According to the results of these analyses, statistically significant differences were found between the means of the proportions M1/M1+M2+M3 (mean ±sd M1= 0.3376 ±0.01119) and M2/M1+M2+M3 (mean ±sd M2= 0.3327 ±0.01137) (Dunn's post-hoc test for Bonferroni corrected p value= 0.001705), and the means of the proportions M1/M1+M2+M3 (mean ±sd M1= 0.3376 ±0.01119), and M3/M1+M2+M3 (mean ±sd M3= 0.3287 ±0.01536) (Dunn's post-hoc test for Bonferroni corrected p value= 3.56E-08).
Conclusions In conclusion, statistically significant differences were found for M1 compared to M2 (M1>M2), and for M1 compared to M3 (M1>M3). M2>M3 occurs but it is not statistically significant, however it is still possible to appreciate a decreasing relationship towards distal from M2. The method of measurement that we used is different of the used by Evans. More studies and analyses are required.

Apoptotic Effect of Three Universal Dental Adhesives in SaOS-2 Cells

A. Araya[1], E. Fernandez[2], S. Buvinic[1], M. Gutierrez[1], N. Hernandez[1]
[1]universidad de chile, [2]Universidad de Chile

Objectives To evaluate the potential apoptosis-mediated cytotoxicity of three universal dental adhesives in the SaOS-2 osteoblast-type cell line
Methods Three universal dental adhesives (Universal Single Bond - 3M ESPE; Universal Ambar - FGM; Prime & Bond Universal - Dentsply) were evaluated at a concentration of 0.1% v/v in the Saos-2 cell line. Three apoptosis indicators were evaluated after 2-4-6h incubation with the adhesives: phosphatidylserine and propidium iodide detection through flow cytometry, detection of cleaved Caspase-3 by immunoblot and evaluation of nuclear morphology through fluorescence microscopy. The cytotoxicity of the adhesives was determined after 24h incubation by MTT assay, in the absence or presence of the Z-VAD-FMK apoptosis inhibitor.
Results A higher percentage of cells in early apoptosis was observed by flow cytometry with the Single Bond adhesive, while the Ambar and Prime & Bond adhesives showed a significant increase in death through necrosis. Only the Single Bond adhesive displayed a significant increase of cleaved Caspase-3 compared to the control. The immunofluorescence imaging evaluation showed apoptosis-compatible cell nucleus for the Single Bond adhesive, while Ambar and Prime & Bond adhesives presented necrotic-like nucleus. The MTT test indicated that the three adhesives significantly reduced cell viability: Single Bond (47,9%), Ambar and Prime & Bond (0%); The Z-VAD-PMK apoptosis inhibitor combined with the Single Bond adhesive significantly increased viability to 79,8%.
Conclusions The evaluated adhesives induce cytotoxicity in Saos-2 cells, with Single Bond being the least aggressive. The results suggest that the Single Bond adhesive mainly causes cell death by apoptosis, while Ambar and Prime & Bond show a tendency to cell death by necrosis

Mean Cephalometric Values in a Population from San Bernardo, Chile.

F. P. Keith Álvarez[1,2], j. A. briceño Risso[2], D. Becerra[3]
[1]Universidad San Sebastian, [2]Universidad de los Andes, [3]Universidad de los Andes

Objectives Cephalometric norms derived for Caucasians population are routinely used for investigations. As these norms show a great variation when applied to different population, it became necessary to establish our ethnic group norm for future research[1].
The aim of this study was to describe vertical, sagittal and soft tissue new means cephalometric parameters and compared them with the standard norm.
Methods 315 cephalometries were analyzed, 17 vertical, sagittal and soft tissue parameters were measured. Normality test and central tendency measures were used to evaluate the new norm of this study group. With a student t-test, the new measures were compared with those described by their respective authors. This study is approved by the scientific board of the Dental Faculty and the central ethics Board from Universidad de los Andes.
Results The 17 variables have a normal distribution. 14 had statistically significant difference ($p = 0$) respect to the standard norms. The variables that stand out are posterior facial height / anterior facial height x 100 (N = 63.8% SD 4.2), sella-nasion angle / gonion-gnation (N = 35.76 DS 5.2), facial axis (N = 88.41 DS 4.1), height of mandibular ramus (N = 39.89mm DS 4.7), mandibular body (N = 58.53mm DS 6.3) and chin projection (N = -8.76mm DS 0.3).
Conclusions The new results presented for the variables that represent proportions or angles proved to be more representative when diagnosing patients, especially in relation to vertical phenotype of craniofacial growth[2]. On the other hand, the linear measurements, were significantly lower than the norm and could be explained by anthropological modifications[3], or environmental changes that may cause a decrease in the mandibular body and ramus growth[2]

***In vitro* effect of oral mouthwashes on *Streptococcus Salivarius* proliferation.**

M. Quintana[2-1], P. Chuhuaicura[1], G. Oporto V[2-1], R. Fuentes[3-1]
[1]Universidad de La Frontera, [2]Universityersidad de La Frontera, [3]Universityersidad de la Frontera

Objectives The aim of this study was to compare the antibacterial effect of eight different mouthwashes on *Streptococcus Salivarius (SS)* bacteria (ATCC 13419) using the agar well diffusion method.
Methods Eight commercial mouthwashes (MWs) (Periogard®, Perio-Aid®, Halita®, Cariax Gingival®, Vitis Orthodontic®, Vitis Encia®, Colgate Plax Soft Mint® and Microdacyn®) were compared. Antibacterial effect was measured using the Agar well diffusion method[5]. The bacteria were extracted from Cultiloops®, rehydrated in brain-heart broth and activated in blood agar plates. Then, bacteria were incubated for 24 hours at 37°C in anaerobiosis using Gaspak ez anaerobe container system®. The colonies were then suspended in trypticase soy agar and diluted to $1.5X10^8$ CFU/mL (Mc Farland standard turbidity 0.5). Eighteen Mueller-Hinton plates were streaked and 4 equidistant perforations (wells) were made. Then, 130 μm of each MWs were deposited in wells. The plates were incubated for 24 hours at 37°C in anaerobiosis. The R[6] software was used to perform statistical analysis.
Results The inhibition zones were measured using an electronic digital caliper.The highest inhibitory effect was observed using Periogard®. Statistically significant differences ($p = 0.0001$ One-way ANOVA, Post-hoc Tukey; Table 1) were found when comparing the inhibition zones of different MWs. However, no significant differences were detected when comparing Periogard® and Perio-Aid®, Halita® and Cariax Gingival®, Microdacyn® and Physiological Saline solution. Only one MW exhibited no antibacterial effect (Mycrodacyn®).
Conclusions SS is a commensal bacteria that has been associated with the production of bacteriocins. It may play a significant role in oral biofilm stabilization. Thus, selection of MWs as a therapeutic tool should be performed carefully and prescribed for limited time periods, to avoid negative effects in the oral homeostasis, but with the aim of controlling potentially pathogen microorganisms.

Mouthwashes (MWs)	Mean ± SD (mm)	Significant Differences
1.-Periogard®	33.82 [±0.91]	5*,6*7*,8*,9*.
2.-Perio-Aid ®	33.77 [±1.35]	5*,6*,7*,8*,9*.
3.-Halita®	29.37 [±0.33]	1*,2*6*,7*,8*,9*.
4.-Cariax Gingival®	28.95[±0.72]	1*,2*,5*,6*,7*,8*,9*.
5.-Vitis Orthodontic®	23.51[±1.03]	7*,8*,9*.
6.-Vitis Encia®	21.17 [±1.69]	5*,7*,8*,9*.
7.-Colgate Plax Soft Mint®	19.39 [±0.59]	8*,9*.
8.-Microdacyn®	9.2	
9.- Physiological Saline solution	9.2	

Higher inhibition was found in “MWs” column compare to the number of MW in the “significant differences” column

Clinical Comparison in Temporary Molars: Filtek Bulk Fill v/s Z350

C. Zapata, R. Requena, C. Alarcón
Universidad Andres Bello

Objectives Evaluate the 6 months clinical performance of a Bulkfill resin and a conventional temporary molar resin using the modified Ryge-USPHS criteria

Methods Were selected 36 Odontopediatric patients between 4-9 years 11 months, who had at least 2 caries lesions in temporary molars, classes I or II, with minimum depth of 2.5 mm in the occlusal cervical direction and an extension less than 1/3 of the intercuspid distance. Participants who had pulp treatment, dental mobility, direct/indirect pulp lining, children with difficult management, and some underlying disease were excluded from the study. In each of these two lesions were randomized in: Group (Z350) filtek-Z350 (3M ESPE) and group (FBF) Filtek-Bulk Fill (3M ESPE). The operators made the biological preparations and the restorations following the clinical protocol: conditioned with 37% orthophosphoric acid (CONDAC FGM) in enamel for 15 seconds, washed twice the etching time, dried 15 seconds, then a layer of Single Bond Universal scotch bond (3M ESPE) rubbed for 20 seconds and blown for 5 seconds with soft air, photopolymerized for 30 seconds with LED light lamp (Coltene) of 1000 mW/cm2 power. After 15 days (baseline) and 6 months of restoration, they were examined using the RYGE / USPHS criteria in marginal adaptation (AD), anatomical shape (AS), surface roughness (SR), contacts (CT), dental sensitivity (DS), color (CL), marginal staining (MS).

Results At 6 months were evaluated 18 patients (N total=36). Average age 6.8 years. Score alpha for:
AD: 25% Z350, 90% FBF;AS: 58,3% Z350, 83,3% FBF; SR: 61,1% Z350, 66,8% FBF; CT: Alpha 83,3% Z350, 100% FBF; DS: Alpha 88,8% Z350, 100% FBF; CL: Alpha 80,5% Z350, 66,8% FBF; MS: Alpha 58,3% Z350, 100% FBF.

Conclusions There are no critical differences in the behavior evaluated in a period of 6 months between both RC, according to the modified Ryge-USPHS criteria.

Severity of Complications in Third Molar Surgery by SCATMS Scale

P. Caro Troncoso[1], P. Aravena Torres[2]
[1]Universidad Viña del Mar, [2]Universidad Austral de Chile

Objectives To determine the most frequent degree of severity of post-surgical complications in exodontics of lower third molars using the SCATMS measurement scale and Identify the possible predisposing factors in the occurrence of complications.

Methods The SCATMS scale was applied during post-operative control (at 7 days) to a total of 48 patients. During the preoperative period, data from the treating surgeon, the patient and the surgical procedure itself were recorded. Responses were statistically analyzed with SPSS v.22 software with a 95% confidence interval.

Results The most frequent degree of severity was mild (68.8%) and the most frequent complication was pain (35.5%). The variables that showed statistical significance in relation to the degree of severity found were: smoker ($p = 0.049$), position of the intraosseous tooth ($p = 0.049$), wound closure by second intention ($p = 0.014$), type of suture (silk) ($p = 0.011$) and use of post surgery ATB “NO” ($p = 0.014$). According to the analysis of the bibliography and the statistical significance found in these variables, their participation could be confirmed, together with surgical trauma as a predisposing factor for the generation of a complication.

Conclusions The most frequent degree of severity found was mild. Being a smoker, position of the intraosseous tooth, wound closure by second intention, use of silk (suture), no use of ATB after surgery and surgical trauma of the procedure, are associated as predisposing to post-surgical complications in lower third molar extraction .

Gráfico 1. Distribución de frecuencias según grado de severidad.

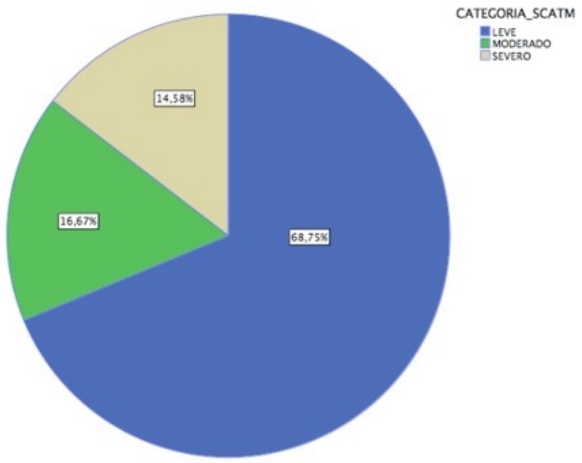
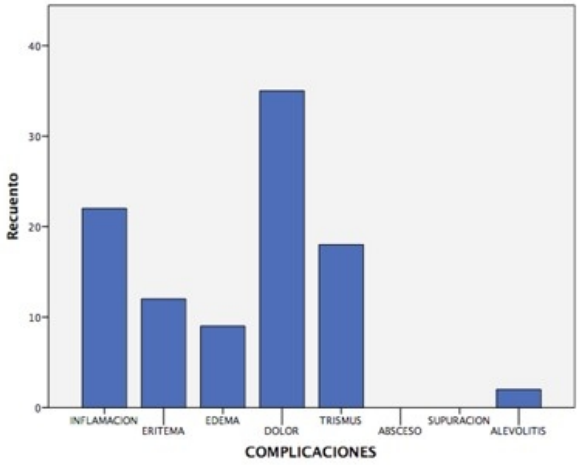


Figura 4. Grafico de frecuencias de complicaciones.



In vitro Assessment of the Apatite-forming Ability of Commercial Calcium Silicate Cements

R. Valdenegro[1], C. Covarrubias[2], C. Corral[3]
[1]Universidad de Chile, [2]Universidad de Chile, [3]Universidad de Chile

Objectives The aim of the study was to evaluate the in-vitro mineralization capability (apatite-forming ability) of two calcium silicate cements materials for endodontics and restorative dentistry purposes: ProRoot® MTA (Dentsply, MTA) and Biodentine® (Septodont, BD).
Methods BD and MTA discs (3 x 1 mm) were prepared. The ability of the materials to induce mineral formation was assessed by immersion in simulated body fluid (SBF), during 3 and 7 days. The surface of discs was analyzed using Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy with energy dispersive X-ray analysis (SEM-EDX) before and after immersion in SBF.
Results FTIR and SEM analysis revealed that both cements showed the deposit of a layer of apatite after 7 days of SBF immersion. However, greater apatite formation was observed on MTA surface. The EDX compositional analysis of the mineral phase showed that the Ca/P molar ratio of MTA was more similar to hydroxyapatite composition, than BD deposits.
Conclusions Although both materials demonstrated bioactive properties, it appears that MTA presents greater ability to form apatite than BD. Further assays are required to confirm if the differences are significant.

Co-cultivation of *Helicobacter pylori* and *Porphyromonas gingivalis* affects biofilm formation and virulence of *P. gingivalis*

C. Soto[1,2], M. Olivera[1], L. Yañez[1], M. Pacheco[1], D. Venegas[1], D. Salinas[1], D. Bravo[1], A. Quest[2]
[1]Laboratorio de Microbiología Oral, Facultad de Odontología, Universidad de Chile, [2]Laboratorio de Comunicaciones Celulares, Facultad de Medicina, Universidad de Chile

Objectives The objective of this work is to determine if the co-culture of *H. pylori* and *P. gingivalis* promotes changes in the ability of *P. gingivalis* to promote biofilm formation, hemagglutination and invasion into gingival epithelial cells. We also aim to determine if the changes in *P. gingivalis* virulence are associated with gene expression modulation of some relevant virulence factors of *P. gingivalis* involved in adhesion and recognition of the bacteria by the gingival epithelial cells and promoting the internalization of *P. gingivalis*, such as fimbriae, hemagglutinins, lipopolysaccharide and gingipains.

Methods To perform the co-culture, a liquid culture was standardized in which *H. pylori* 26695 and *P. gingivalis* W50 can grow (BHI, hemin, menadione, VITOX and equine serum, 37 ° C, anaerobiosis). After that time, *P. gingivalis* was isolated from the co-culture to perform hemagglutination tests by combining red blood cells with the bacteria by 3 h and observing the formation or not of a "clot". Biofilm formation tests was performed by staining the formed biofilm after 48hrs with safranin and measuring the amount of stain adhered to the biofilm by spectrophotometry. Invasion ability to gingival epithelial cells was assayed after 2hrs after infection by CFU counting after cell lysis. Finally, qPCR was performed to measure the mRNA expression of virulence factors of *P. gingivalis*.
Results Our results showed that *P. gingivalis* previously co-cultivated with *H. pylori* for 1 or 2 days, has a greater capacity to form biofilm, a higher hemagglutination rate and it is able to invade in a greater amount epithelial cells with respect to *P. gingivalis* grown in monoculture. Also, the co-culture promoted an increase of the expression of 3 virulence factors: 2 hemagglutinins (HagA and HagC), and 1 gingipain (RgpB). These factors are reported to be important in the adherence and infection of *P. gingivalis* and could be clinically important due to reports that associate more virulent strains of *P. gingivalis* to the severity of chronic periodontitis.
Conclusions Together, these results suggest that *H. pylori* enhances the virulence of *P. gingivalis*, in part, increasing the mRNA expression of virulence factors associated with adhesion and invasion of the bacteria and migration of gingival epithelial cells infected with *P. gingivalis*.