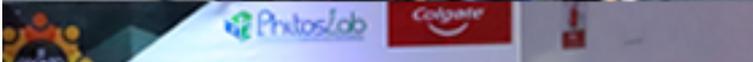


# BDS Brazilian Dental Science





Brazilian  
Dental Science

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UNIVERSIDADE ESTADUAL PAULISTA  
"JULIO DE MESQUITA FILHO"  
Instituto de Ciência e Tecnologia  
Campus de São José dos Campos



# III ODONTO MEETING IX CEAJO

PROCEEDINGS



October, 2-5, 2020  
São José dos Campos - SP - Brazil

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## Summary

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### III ODONTOMEETING / IX CEAJO

On the 2nd to 5th of October 2019, the 3rd edition of Odontomeeting (IXCEAJO), Dental Congress of the São José dos Campos Institute of Science and Technology of Unesp was held. The event is already a tradition of this important Dentistry school in our country, however, since 2015, when the old name CEAJO (Congress of Alumni and Dental Journey) was replaced by Odontomeeting, higher levels were reached. The 2019 event was a milestone in the history of the Congress, with the presence of more than 40 speakers and 700 registrants, we reached the rank of the largest University Congress in Brazil. The Congress takes place every 2 years and is attended by undergraduate, graduate students and professors from different institutions, as well as professionals from the entire region of Vale do Paraíba, NorthCoast, South of Minas and Capital.

The Organizing Committee was composed of undergraduate, graduate students, professors and administrative technical servers at the São José dos Campos Institute of Science and Technology of Unesp. I would like to give special thanks to this committee, which was impeccable, worked hard with a smile on its face to deliver to our guests the best meeting this institute has ever seen.

The III Odontomeeting was also a milestone in scientific terms, a total of 188 papers were presented, divided into 6 categories (Basic, Clinical / Epidemiological Study, Laboratory Tests, Clinical Case and Extension), also separated into undergraduate and graduate courses. These presentations were an excellent opportunity to show to the society the serious work that is carried out within higher education institutions, whether public or private. The scientific power of III Odontomeeting gains even more notoriety with the opportunity to publish the abstracts in this important magazine in the area. I would like to give a special thanks to the editorial board of Brazilian Dental Science on behalf of its Editor in Chief Prof Tit. Sérgio Eduardo de Paiva Gonçalves for publishing this special edition.



*Prof. Dr. João Maurício Ferraz da Silva  
President of the III Odonto Meeting / IX CEAJO*

### III ODONTOMEETING / IX CEAJO

Nos dias 2 a 5 de Outubro de 2019 foi realizada a 3ª edição do Odontomeeting (IX CEAJO), Congresso Odontológico do Instituto de Ciência e Tecnologia de São José dos Campos - Unesp. O evento já é uma tradição desta importante escola de Odontologia de nosso país, porém, desde 2015, quando o antigo nome CEAJO (Congresso de Ex-alunos e Jornada Odontológica) foi substituído por Odontomeeting, patamares mais altos foram atingidos. O evento de 2019, foi um marco na história do Congresso, com a presença de mais de 40 palestrantes e 700 inscritos, atingimos o posto de maior Congresso Universitário do Brasil. O Congresso acontece a cada 2 anos e conta com a presença de alunos de graduação, pós-graduação e docentes de diversas instituições, além de profissionais de toda a região do Vale do Paraíba, Litoral Norte, Sul de Minas e Capital.

A Comissão Organizadora foi composta por alunos de graduação, pós-graduação, docentes e servidores técnicos administrativos do Instituto de Ciência e Tecnologia de São José dos Campos - Unesp. Faço aqui um agradecimento especial a esta comissão que foi impecável, trabalhou arduamente com sorriso no rosto para entregar aos nossos congressistas o melhor congresso que este instituto já viu.

O III Odontomeeting também foi um marco em termos científicos, foram apresentados um total de 188 trabalhos, divididos em 6 categorias (Básicas, Estudo Clínico / Epidemiológico, Ensaio Laboratoriais, Caso Clínico e Extensão), também separadas em graduação e pós-graduação. Estas apresentações foram uma excelente oportunidade de mostrar para a sociedade o trabalho sério que é realizado dentro das instituições de ensino superior, sejam elas públicas ou privadas. O poder científico do III Odontomeeting ganha ainda mais notoriedade com a oportunidade de publicação dos anais nesta importante revista da área. Faço então um agradecimento especial ao corpo editorial da Brazilian Dental Science em nome de seu Editor Chefe Prof. Tit. Sérgio Eduardo de Paiva Gonçalves pela publicação desta edição especial.



*Prof. Dr. João Maurício Ferraz da Silva  
President of the III Odonto Meeting / IX CEAJO*

**IMMEDIATE IMPLANTS WITH USE OF BONE GRAFT FOR CEMENTED UNIT PROSTHESES:  
CASE REPORT*****Implantes imediatos com utilização de enxerto ósseo para próteses unitárias cimentadas:  
relato de caso clínico.***

Rossi NR, Schestatsky R, Rodrigues MR, Tribst JPM, Dal Piva AMO, Grangeiro MTV, Kimpara ET, Paes Júnior TJA  
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The benefits provided by an implant compared to a fixed partial prosthesis have established implants as the preferred treatment alternative in most clinical situations. Immediate post-extraction implant placement greatly reduces rehabilitation time, avoiding a second surgical phase. Gap filling between the implant and the residual vestibular wall is a surgical strategy that improves aesthetic parameters and reduces the resorption rate. Thus, the objective of this study is to demonstrate, through a clinical case, that the placement of immediate implants using bone graft can yield good results. A 55-year-old female patient, leucoderma, sought dental treatment due to root fracture of tooth 15. She had a 2-element fixed prosthesis on one root. It was performed extraction and immediate installation of two implants and filling of the alveoli after extraction with bovine bone graft. There was no ideal primary stability, so the cementation of the provisionals was made on neighboring teeth. After six months, the implants were reopened and it was installed unitary cementable abutments. It was used click system transfers and made the model that was sent to the dental technician. Thus, the crowns of emax were cemented with relyx U200 cement, achieving clinical, functional and aesthetic success. It can be concluded that the placement of immediate implants with bone graft can generate adequate results.

**Keywords:** Dental implants; Tooth extraction; Bone graft; Dental prosthesis

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**FASCIAL CELLULITIS OF ODONTOGENIC ORIGIN: A SERIOUS DENTAL URGENCY  
*Celulite fascial de origem odontogênica: uma grave urgência odontológica.***

Moreira MS, Oliveira IJM, Santos KA, Oliveira AG, Alves MS, Moraes MB  
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Odontogenic infections can lead to abscess formation, which when they do not drain through the oral cavity and / or skin surface, diffusely migrate to the soft tissue fascial planes, setting up cellulite. Severe complications can occur if the treatment instituted is not appropriate and may progress to airway obstruction, cavernous sinus thrombosis, mediastinitis and even death of the individual. We report a case of a 20-year-old female patient, melanoderma, with unilateral hardened swelling after extraction of the right lower third molar. Clinical examination showed swollen region, flushing, difficulty opening the mouth, elevation in body temperature, local pain and facial asymmetry; like a picture of facial cellulitis of odontogenic origin. The treatment of choice was based on immediate drainage and irrigation of the region with saline, which in turn allowed a considerable improvement of the patient's clinical

condition. Subsequently, Clindamycin 300 mg was prescribed for 10 days, associated with amoxicillin that a patient had already used. After four days of drainage and irrigation procedures associated with the use of the drug, the infectious process completely regressed, with noticeable disappearance of swelling, asymmetry and facial swelling. Therefore, we emphasize the importance of the dental surgeon to understand the severity of fascial cellulitis and its correct treatment, due to its rapid evolution and serious complications leading some individuals to death.

**Keywords:** Cellulitis; Infection; Inflammatory Diseases.

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03  
Case report

### **ORTHODONTIC TREATMENT OF MANDIBULAR PROPULSION AND ALTERATION OF GLOBAL POSTURAL CHANGE**

#### ***Tratamento ortodôntico de propulsão mandibular e alteração de mudança postural global***

Silva DA, Kozel JAA  
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The Class II is a very common malocclusion and the poor relation of the maxilla and mandible can be one of its causes. In 70% of the cases of skeletal Class II, the mandible is retruded and it can be associated with mouth breathing and general postural alteration of the patient. To facilitate the air passage through the oropharynx, patients tend to flex the neck anteriorly. The aim of this study was to confirm if there was a global postural alteration of the patient immediately after the installation of the MPA (Mandibular Protraction Appliance). The clinical case reported is of a 15-year-old male, skeletal Class II, with accentuated overjet and overbite. It was decided to use a conventional Morelli Roth Max® fixed bracket appliance, triple tube bands on upper first molars, a sequence of heat activated NiTi wires, evolving to steel wires up to 0.018 "X0.025", at which point, an MPA was installed and immediate clinical and photographic evaluation of the postural alteration was performed. The immediate result was advancement of the mandible and postural correction of the patient, which allowed a better nasopharyngeal airway. Through to the present study, we conclude that MPA is effective and safe in altering the patient's overall posture.

**Keywords:** Malocclusion; Angle Class II; Tooth Diseases.

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04  
Case report

### **DIGITAL SMILE DESIGN: CLINICAL CASE REPORT THROUGH THE USE OF THE DIGITAL TOOL**

#### ***Digital smile design: relato de caso clínico através do uso da ferramenta digital***

Ricco P, Rossi NR, Rodrigues MR, Matos JDM, Grangeiro MTV, Paes Junior TJA  
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Smile design refers to the many scientific and artistic principles that can create a harmonic smile. To draw lines of references on extra and intraoral pictures can help to evaluate aesthetics and function. These parameters are the medium line, the smile high line, the smile

curve, the intra and interdental proportions, among others, which are used in Digital Smile Design (DSD). The aim of this clinical study is to demonstrate the sequence of the DSD in a 62-year-old, leukoderma, male patient. It was performed anamnesis, clinical examination, photographs, study and functional impression of both arches and semi-adjustable articulator set up. In addition, the DSD photographic protocol was performed. Treatment was defined as the replacement of the upper complete denture and the lower removable prosthesis with recovery of the vertical dimension of occlusion. The combination of the photographs and the position of the teeth for total superior prosthesis in articulator, related to the inferior arch, it was found that there was lack of dominance of the superior central incisors, thus, teeth were selected with cervical-incisal dimension compatible to the harmony of the smile. Preparations indicated for removable partial dentures were performed. After that, it was performed inferior impression and infrastructure confection. The infrastructure was tried on and a new articulator set up were performed, relating the lower model to the model of the new superior total prosthesis. In this way, it was possible to describe the sequence of photos used by the DSD tool.

**Keywords:** Esthetics; Dental; Dental Restoration Repair.

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05  
Case report

#### **REHABILITATION PROTOCOL IN PATIENTS IN NEED OF OCCLUSAL VERTICAL DIMENSION RESTORATION: CLINICAL CASE REPORT**

***Protocolo de reabilitação em paciente com necessidade de restabelecimento da dimensão vertical de oclusão: relato de caso clínico***

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The rehabilitation of patients with reduced occlusal vertical dimension (OVD) is essential to restore comfort, esthetic and function to the individual. Changes related to decreased OVD may impair the longevity of the stomatognathic system. The aim of this case report is to describe a protocol for prosthetic rehabilitation in patients in need of occlusal vertical dimension restoration. A 50 year old male patient attended the clinic complaining of pain in the tooth 22. Clinical and radiographic examination revealed a root fracture in this element, absence of tooth 36, several occlusal wear facets and decreased vertical dimension. Case planning was performed in a semi-adjustable articulator and diagnostic wax-up and oral imaging examination, as planning the treatment was started with the extraction of 22 and installation of osseointegrated implants in the region of teeth 22 and 36. Temporary crowns were made according to the previous waxing to evaluate the increase of the planned vertical dimension. After esthetic and functional analysis, it was decided to initiate restorations through the lower arch to reestablish the antero-posterior and mediolateral curve. After that, the upper elements were made to promote esthetics and to recover the final occlusal vertical dimension. In total, 28 lithium disilicate ceramic restorations were cemented. It was concluded the restoration of the vertical dimension succeeded in returning function and esthetics to the patient.

**Keywords:** Dental Restoration Repair; Dental Restoration; Vertical Dimension.

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**BASALOID SQUAMOUS CARCINOMA: A RARE AND AGGRESSIVE VARIANT OF SQUAMOUS CELL CARCINOMA**

*Carcinoma escamoso basaloide: variante rara e agressiva do carcinoma de células escamosas*

Alves MS, Lima IAB, Almeida JD, Carvalho YR, Carvalho BFC, Miranda KC, Rodrigues NS, Anbinder AL

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Basaloid squamous cell carcinoma is a rare and aggressive variant of squamous cell carcinoma with basaloid and squamous components and predilection for the larynx, hypopharynx and tongue base. It most commonly occurs in older men with a history of smoking and alcohol abuse. We report a case of a 71-year-old male patient with the presence of a painful and bleeding ulcer in the right border and tongue belly, extending from the lingual apex to the posterior region. The lesion was hardened and infiltrating, which prevented tongue movement. Histopathological examination after incisional biopsy showed malignant epithelial neoplasia with basal cell lobules and islands, in the center of which there are keratin pearls or comedonecrosis foci, sometimes associated with neutrophilic exocytosis. The basaloid cells had hyperchromatic, pleomorphic oval nuclei with indistinct nucleoli, cariorex, and numerous atypical mitotic figures. With the diagnosis of basaloid squamous carcinoma, the patient was referred for cancer treatment, but died 11 months after the initial consult, even before start the treatment. This highlights the importance of proper clinical examination and early diagnosis of oral lesions, and presents a rare variant of squamous cell carcinoma, usually with poor prognosis, and little known by the general practitioner.

**Keywords:** Basaloid squamous cell carcinoma; Oral cavity; Squamous cell carcinoma.

**VERRUCIFORM XANTOMA CLINICALLY DIAGNOSED AS INFLAMMATORY FIBROUS HYPERPLASIA: REPORT OF A RARE CASE.**

*Xantoma verruciforme clinicamente diagnosticado como hiperplasia fibrosa inflamatória: relato de um caso raro.*

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Verruciform xanthoma is a rare benign proliferative lesion of undetermined etiology that can affect the oral mucosa, skin and genitalia. We report a case of a 80-year old female Causasian patient, complete denture wearer, that developed a lesion close to buccal vestibule with a 2-year evolution history. Clinically, a sessile nodule of approximately 2 cm in its largest diameter, with a well-defined base, irregular surface, and coloration similar to the adjacent mucosa was observed. With the hypothesis of inflammatory fibrous hyperplasia, an excisional biopsy was performed. Histopathological examination showed papillary proliferation of fibrous connective tissue, covered by parakeratinized stratified squamous epithelium with foamy macrophages (CD68 positive) grouped in the juxtaepithelial region. The final diagnosis was verruciform

xanthoma and the patient is under routine follow-up without recurrence. Verruciform xanthoma usually has a rough or papillary surface and may be misdiagnosed as squamous papilloma and condyloma acuminatum, but the role of HPV in its development is not established. In the case discussed, the lesion clinically resembled fibrous hyperplasia, which contributes to its peculiarity.

**Keywords:** Oral Cavity; Verruciform Xanthoma; Granular Cells.

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08

Case report

**OVERDENTURE ON DENTAL REMAINING IN ONCOLOGICAL PATIENTS: Case Report**  
***Overdenture sobre remanescente dental em paciente oncológico: relato de caso***

Carvalho VG, Moreira-Júnior C, Marques AC, Ribeiro TC, Silva CD, Santos LM, Paes-Júnior TJA  
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Head and neck cancer occupies the seventh place among the most common neoplasms in the world, with an annual incidence of approximately 640,000 new cases. Radiotherapy treatment has been highlighted, because there is greater tissue preservation, possibility of regression of the disease, decreased tumor volume, prevention of possible tumor recurrences and metastases, and even total cancer cure, but patients undergoing radiotherapy are at high risk of osteoradionecrosis if they perform surgical interventions in the region, such as dental implants and dental extraction, making prosthetic rehabilitation of partially edentulous patients. after treating oral cancer something complex and often disconsidered; although it is a crucial factor in restoring oral function. Thus, the aim of the present study was to describe the planning, treatment and follow-up of a nine-month prosthetic approach to rehabilitate the lower arch shape and function of a partially edentulous patient undergoing head and neck radiotherapy with a full denture overdenture mucus supported and tooth retained. After nine months of follow-up, it was possible to evidence the functional and aesthetic clinical success, with preserved occlusal pattern, rim and dental remnants.

**Keywords:** Dental Prosthesis; Overdenture; Osteoradionecrosis.

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09

Case report

**TREATMENT OF BUCCOSINUSUAL COMMUNICATION: CLINICAL CASE**  
***Tratamento de comunicação bucos sinusal: Caso Clínico***

Gonçalves TF\*, Raldi FV, Nascimento RD, Moraes MB  
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Buccosinusal communication is a pathological communication that occurs between the oral cavity and the maxillary sinus. When this communication undergoes epithelialization, it is called buccosinusal fistula. It arises mainly after maxillary posterior teeth extraction due to the close relationship of its roots to the floor of the maxillary sinus. The aim of this paper is to describe a case of a 38-year-old female patient who, after tooth extraction 25, presented a large buccosinusal fistula. She sought the discipline of Buccomaxillofacial Surgery and

Traumatology at ICT / Unesp, complaining of pain, fetid odor in the oral cavity and the presence of fluids and food in the nasal cavity. Two surgical techniques were performed for treatment at different times, due to the patient's habits. Several surgical techniques can be used for the closure of buccosinusual fistulas, their choice should be based on the size of the communication, local tissue conditions, surgeon skills, and the cost of the procedure. The technique used in the present case was satisfactory and effective, considering the importance of patient cooperation.

**Keywords:** Maxillary Sinus; Extraction; Oral Fistula.

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Case report

#### **EVALUATION OF PERIODONTAL DISEASE IN PATIENTS WITH DIABETES MELLITUS BY THE PISA INDEX**

##### ***Avaliação da doença periodontal em pacientes portadores de diabetes mellitus por meio do índice pisa***

Silva LSS, Pedroso JF, Souza VS, Lotfollahi Z, Sehnem AL, Figueiredo-Neto AM, Marco AC, Jardini MAN  
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Periodontal disease is characterized by periodontal tissue inflammation and its main etiological factor is bacterial biofilm. It may lead to early tooth loss and changes in serum markers. The influence of periodontal treatment in patients with type 2 diabetes mellitus (DM2) was evaluated through the PISA (Periodontal Inflamed Surface Area) Index, C - reactive protein (hs-PCR) and glycated hemoglobin (A1c). Diabetic patients with periodontitis (Group 1) (n = 24) and diabetic patients with gingivitis (Group 2) (n = 24) were followed for 12 months. Group 1 was treated with periodontal debridement, and Group 2 received supragingival scraping and prophylaxis. In both groups, periodontal clinical parameters: PS (Probing Depth), CIN (Clinical Insertion Level), RG (Gingival Recession), GI (Gingival Bleeding Index) and PI (Plaque Index; and serum parameters: hs- CRP and A1c were measured at baseline, t = 6 and t = 12 after periodontal treatment. Clinical measurements were collected for PISA spreadsheet feeding. Periodontal clinical parameters showed significant improvement (p <0.05) in both groups after 12 months. PISA measurements showed a significant reduction (p <0.0001) after 6 and 12 months for both groups. In Group 1, hs-PCR showed a significant reduction (p = 0.041) after 12 months and A1c, reduced with statistical significance (p = 0.006) at t = 6. Periodontal therapy may influence the PISA Index and systemic inflammatory and glycemic markers in patients with T2DM.

**Keywords:** Periodontal disease; Diabetes Mellitus; Guided Tissue Regeneration; Periodontal.

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Case report

#### **THE CHALLENGE OF UNITARY ESTHETIC REHABILITATION IN THE ANTERIOR TOOTH: CASE REPORT**

##### ***O desafio da reabilitação estética unitária em dente anterior: relato de caso***

Santos MC, Pierre FZ, Mocelin RC, Uemura ES, Araujo RM, Silva JMF  
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Patient J.A, 40, suffered bike fall fracturing the element 11 with the involvement of enamel and dentin without pulp exposure. The patient was referred for immediate medical/dental care and submitted to a detailed evaluation of other possible compromises. Radiographic examinations and tomography did not show any face fracture of the and in the teeth at root level. Coronary fracture needed a class IV preparation which was did with composite resin. Two years later the patient complained of the color and shape restoration because was not correctly mimicking a natural tooth, causing discomfort while smiling. Patient then sought Graduate Clinic in Ceramic Laminates of ICT-UNESP in São José dos Campos intending to improve his aesthetic condition. At the clinical examination, it was planned to replace the resin restoration with a lithium disilicate laminate veneer, seeking an ideal anatomical condition and a natural color. Aesthetic rehabilitation on anterior teeth brings high expectations for the patient, making it a major challenge for the dental surgeon and technician. The treatment option used for this case, rehabilitation with the lithium disilicate unit veneer was very well indicated because its aesthetic, mechanical and biological properties provided an excellent resolution for the case in a conservative way.

**Keywords:** Dental Veneers; Lithium Disilicate; Dental Esthetics.

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Case report

#### **MULTIDISCIPLINARY TREATMENT IN A FEMALE PATIENT WITH A COMMITMENT OF PINK AND WHITE AESTHETICS**

##### ***Tratamento multidisciplinar em paciente feminino com comprometimento da estética rosa e branca***

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The dentist has an obligation to make an assertive diagnosis and planning to satisfy not only the aesthetic requirements of the patient but also to meet the needs of restorative treatments respecting the gingival integrity and periodontal structures.. Therefore, there is a need to resort to a multidisciplinary approach. The purpose of this article is to report a multidisciplinary treatment that achieves a biological integrated aesthetically restoration. A 40-year-old female patient, who came to the consult for presenting non-conformity of her smile. She had a misfit resin veneer on tooth 12 and a misfit mesial and distal resin restoration on tooth 11. It had a total metal-ceramic crown on tooth 21, besides presenting gingival smile. DSD (Digital Smile Design) planning was performed to arrive at a correct smile design in harmony with the patient's face. Through diagnostic wax-up based on DSD planning, the Mock-Up was performed for final visualization of the proposed treatment. By receiving the patient approval, we perform the following treatment: gingivectomy of teeth 13 to tooth 23, intraradicular post of glass fiber in tooth 12, crowns of lithium disilicate on teeth 12 and 21, and lithium disilicate veneers on teeth 13, 11, 22 and 23. The case achieves the right relation between dentogingival through multidisciplinary treatment, creating long term harmony of pink and white aesthetics and increasing patient self-esteem.

**Keywords:** Restorative dentistry; Gingiva; Multidisciplinary approach; Esthetics.

**NASOLABIAL CYST: REPORT OF AN UNUSUAL CASE*****Cisto nasolabial: relato de um caso incomum***

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Nasolabial or nasoalveolar cyst is an uncommon soft tissue non-odontogenic developmental cyst that occurs in the upper lip, lateral to the midline and 10% of cases occur bilaterally. Its pathogenesis is unclear. The most accepted theory is its occurrence due to the ectopic deposition of epithelium from the nasolacrimal duct. We report a case of a 37-year-old diabetic woman, who presented with complaint of asymptomatic upper lip enlargement. In the extraoral examination was noted slight elevation of the left-wing of the nose, with fading of nasolabial fold. In intraoral examination, was observed a swelling in the region of incisors to canine, with soft consistency to palpation. With a diagnostic hypothesis (DH) of a nasolabial cyst, an excisional biopsy was performed. On microscopic analysis, histological sections revealed a cystic capsule fragment lined with ciliated pseudostratified columnar epithelium. The capsule consisted of fibrous connective tissue associated with abundant skeletal striated muscle. Final diagnosis confirmed the DH of nasolabial cyst. Treatment is a complete excision and recurrences are rare. Patient had good healing with no complications after 4 months of follow up.

**Keywords:** Nasolabial cyst; Oral cyst; Oral medicine; Oral pathology.

**ORAL REHABILITATION IN DENTAL EROSION WITH PORCELAIN FACETS*****Reabilitação oral em erosão dental com facetas em porcelana***

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Tooth wear is characterized by the loss of dental structure due to the dissolution of non-bacterial acids from several factors, such as certain foods consumption, beverages, medications, parafunctional habits, gastric reflux, among others. This loss of tooth structure may lead to dentin hypersensitivity and the need for conservative or more invasive treatment such as direct restorations or porcelain veneers. Therefore, this paper reports the case of a male patient with erosion in all teeth of the upper arch who attended at Dentistry Clinic of the ICT (Unesp). Firstly a study model was made for planning the case, and a 2mm increase of the incisal guide, due to the loss of the vertical dimension (DV) and later to the diagnostic waxing. The models were then scanned, and porcelain veneers were also made using the CAD-CAM system. The waxed model was molded in condensation silicone, poured into bisacrylic resin and inserted into position in the oral cavity for use as a provisional restoration. After the provisionals were made, they were cemented for 30 days. From the beginning, patient used a myorelaxant plate in order to recover the lost vertical dimension. During permanent cementation, teeth were conditioned and cemented with Enforce cement (Dentsply)

according to the manufacturer's instructions and occlusal adjustments. It was concluded that the diagnosis and the correct treatment plan contributed to the rehabilitation success, bringing back patient's vertical dimension, function, aesthetics, and self-esteem.

**Keywords:** Tooth wear; Rehabilitation, Mouth; CAD CAM; Dental Porcelain.

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Case report

**BOTRIOID ODONTOGENIC CYST: CASE REPORT EMPHASIZING THE DIFFERENTIAL DIAGNOSIS**  
*Cisto odontogênico botrioide: relato de caso enfatizando os diagnósticos diferenciais*

Milhan NVM, Ribeiro JL, Costa PVB, Anbinder AL  
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Botryoid odontogenic cyst (BOC) is a rare lesion that exhibits the same microscopic features of a lateral periodontal cyst, although it is characterized by multiple cystic spaces and more aggressive clinical behavior. The aim of this work is to report a case of BOC, and to discuss the clinical and histological characteristics of the lesion, correlating them with the diagnostic difficulty due to differential diagnoses. Female patient, 54-year-old, presenting mandibular multilocular lesion delimited by a radiopaque border, in the canine and lower first premolar region. Incisional biopsy was performed, and microscopic analysis revealed fragments of connective tissue presenting multiple cavities lined by non-keratinized stratified or cuboidal epithelium, with few layers of cells and thickening areas, exhibiting PAS-negative and sometimes whorled morphology. Some superficial cells of the epithelium presented apocrine degeneration. Based on the findings, the diagnosis was "compatible with BOC". However, a note was released indicating the glandular odontogenic cyst as an important differential diagnosis and emphasizing the importance of total excision of the lesion and microscopic analysis of this surgical specimen, since both lesions present aggressive behavior. Patient was referred to surgical treatment to removal the lesion completely.

**Keywords:** Odontogenic cysts; Periodontal cyst; Lateral Cysts; Glandular Neoplasms.

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Case report

**DIGITAL FLOW ON SINGLE LITHIUM DISILICATE VENEER: A CASE REPORT**  
*Fluxo digital em faceta unitária de dissilicato de lítio. Relato de caso clínico*

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As technology advances, clinical practice has been undergoing major modernizations, one of which is the replacement of conventional impression materials by intraoral scans which aim to reduce chances of processing errors through the direct capture of three-dimensional high resolution models of dental elements and arches, eliminating laboratory steps as bench waxing and conventional scanning. To date, this practice has been showing satisfactory results through prosthetic parts requiring little or no wear to fit on dental preparations, providing good marginal adaptation and excellent aesthetic results even the temporary crowns stage.

Machinable are the materials most benefited by this technique. In the present case, lithium disilicate (E.max Ivoclar-Vivadent) was used to make a veneer in element 21, relying exclusively on this new methodology during the proposed treatment.

**Keywords:** Lithium disilicate; Dental materials; Scanning.

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Case report

#### **TREATMENT OF INFRABONY DEFECT IN PATIENT WITH GRADE C PERIODONTITIS AND LICHEN PLANUS: CASE REPORT**

***Tratamento de defeito infraósseo em paciente com periodontite grau c e líquen plano: relato de caso***

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Aggressive phenotype of periodontitis may be associated with infrabony defects and residual pockets, demanding surgical procedures for scaling or regenerative therapies. In literature, the relation between Lichen planus and periodontal diseases has not been well elucidated. This report presents a therapeutic approaches adopted for the treatment of an infrabony defect in a patient with grade C periodontitis with molar-incisor pattern and lichen planus. In the initial assessment residual pigmented macules, Wickham stretch mark in gingival mucosa, presence of periodontal pockets (6 moderate and 9 deep), gingival index of 22% and infrabony defect in the teeth 21, were observed After diagnosis and patient consent the treatment was started with non-surgical periodontal therapy, followed by surgical access for scaling and placement of xenogenous bone graft for treatment of residual pocket in element 21. After 18 months of periodontal supportive therapy, patient received orthodontic treatment for anterior diastema associated with periodontal therapy. After orthodontic therapy, tooth 21 received a surgical procedure for root covering using subepithelial connective tissue graft to correct gingival recession, improving the aesthetic of the region. It was concluded that the therapeutic approaches adopted and continuous patient monitoring are able to provide satisfactory and stable long-term results.

**Keywords:** Periodontitis; Lichen planus.

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Case report

#### **THE AID OF SLOW MAXILLARY EXPANSION DURING ERUPTION OF PERMANENT TEETH IN DENTITION**

***O auxílio da expansão lenta da maxila durante a erupção dos dentes permanentes na dentição mista***

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Lack of space for the eruption of permanent teeth in children during the mixed dentition phase

is one of the most common problems encountered in the clinical life of Orthopedics. Maxillary transverse expansion during the mixed dentition phase can be performed with the aid of a removable expander device, generating space gain for an eruption of permanent teeth, such as canines. The treatment was performed in a 9-year-old female patient, after upper frenum removal surgery, with 12-month upper removable expander device with biweekly activations and one or two quarter-turn expansion. The use of removable devices for slow maxillary expansion is an effective and simple option to be used in the mixed dentition phase, to help space gain for permanent teeth eruption. The removable upper expander device with slow maxillary expansion, was effective in the treatment of atresia, directing the eruption of canines and other permanent teeth, also acting indirectly on the transverse dimensions of lower arch, therefore, the use of removable devices for slow maxillary expansion is an effective and simple option to be used in the mixed dentition phase, to help gain space in the permanent teeth eruption.

**Keywords:** Mixed dentition; Expander apparatus; Palatal expansion technique.

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Case report

**BUMPER AID FOR RETRACTION OF ANTERIOR TEETH WITH SEVERE CROWDING AFTER EXTRACTION OF FIRST MOLARS IN CASE OF CLASS III**

*Auxílio do bumper em retração de dentes anteriores com apinhamento severo, após extrações, em caso cirúrgico de classe III*

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Lower dental crowding is one of the most common problems in the dental clinic, exerting great importance in determining the type of treatment for a malocclusion with this feature; crowding can be caused by lack of spaces in the bone base, which can be caused by the deficient dental arch size, for example. The use of Bumper in self-ligating fixed orthodontics in cases of severe anterior crowding with posterior extractions, aims at a satisfactory retraction result due to a favorable mechanic "slip". The force exerted by the lower lip during speech, chewing and swallowing is a great aid in retracting the anterior teeth using bumper after posterior teeth extractions. The treatment performed at the postgraduate dental clinic FACSETE - ORTOGEO Unit - São José dos Campos, (a 20-year-old male patient), surgical class III with previous open bite proposed the extraction of the lower first molars using a "silicone tube" in the bumper function orthodontic wire for retraction of anterior teeth, as well as in aid of previous correction of severe crowding. Retraction mechanics with a Bumper achieved a satisfactory result within a few months with successful and previous crowding correction.

**Keywords:** Dental crowding; Active lip plate; Malocclusion.

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Case report

**EXODONTIA OF THIRD MOLAR IMPACTED BY PRESENCE OF A RETROMOLAR CHANNEL: CASE REPORT**

*Exodontia de terceiro molar impactado com a presença de canal retromolar: relato de caso*

Marques AC, Silva CD, Carvalho VG, Silva IB, Nascimento RD, Raldi FV, Moraes MB  
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The retromolar canal is an anatomical variation of the mandibular canal that must be detected before the surgical procedure through imaging exams. Literature suggests that it is not a rare anatomical structure and its frequency is relevant for performing surgical procedures. The aim of this study is to present a case report of a retromolar canal associated with lower third molar extraction. A 19-year-old male patient sought care at the ICT / Unesp CTBMF clinic for third molar extraction. After panoramic radiographic analysis a presence of a retromolar canal was detected in the 38 tooth region. Extraction was performed with adequate anesthetic technique and delicate movements to avoid trans and postoperative complications. Patient had no complications during postoperative follow-up. Thus, it was concluded that knowing and identifying this anatomical variation in the mandibular canal through imaging exams is of fundamental importance in dental practice. It also confirms the importance of a thorough knowledge of the retromolar region in order to have predictability in planning and minimization of anesthetic failures and surgical complications.

**Key words:** Jaw; Oral surgery; Third molar.

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Case report

#### **ORTHODONTIC PREPARATION AND ANTERIOR RESTORATIVE RE-ANATOMIZATION WITH COMPOSITE RESIN: CASE REPORT**

***Preparo ortodôntico e reanatomizações restauradoras anteriores com resina composta: relato de caso clínico***

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Treating misaligned teeth is a challenge, especially in cases of large diastemas and severe crowding. Options for improving function and esthetics are limited, often involving high costs and multidisciplinary treatments. Direct composite resin restorations may be an alternative for realigning relapsed orthodontic teeth where orthodontic retreatment is not indicated. Its cost, conservative approach and esthetics allow restorations to fulfill the finishing role in certain complex orthodontic cases. Thus, the objective of the study was to describe the multidisciplinary treatment performed in a 50-year-old female patient who presented to the GAPEC Operative Dentistry clinic of the ICT UNESP Restorative Dentistry department, with severe biological (carious), esthetic and functional impairment in several elements. The treatment plan required a multidisciplinary approach involving surgical procedures (extraction), periodontics (root planning, scaling and prophylaxis), orthodontics (realignment and leveling), occlusion (semi-adjustable articulator planning and diagnostic waxing) and finishing with restorative treatments (direct veneers). After three months of follow-up, it was possible to present functional and esthetic clinical success, with preserved occlusal guides and post-orthodontic occlusal pattern.

**Keywords:** Orthodontics; Operative Dentistry; Composite Resins.

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**PARENDODONTIC SURGERY AND INTENTIONAL RE-IMPLANTATION: CASE REPORT*****Cirurgia parendodôntica e reimplante intencional: relato de caso***

Achkar VNR, Barros ACP, Moraes RM, Anbinder AL, Mohara N, Neiva V, Otani A  
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Intentional re-implantation (IR) is the last alternative for some cases of endodontic retreatment with persistent lesions. In this related case, a 53 years old male patient presented recurrence of periapical lesions on teeth 11 and 21. Computed tomography showed two distinct lesions related to the apex of each tooth. No cracking or root fracture was observed. It was decided to perform a new apicectomy, whose diagnosis of the collected tissue was inflammatory cyst. Three months after the procedure, tooth 11 presented a fistula. Therefore, the IR was considered: the root was extracted and observed under a microscope, confirming absence of cracking. Immediately, retrofilling and re-implantation were performed. The case has been in proservation for 4 months, with no sign of relapse. In the literature there are scarce reports of cases of IR performed after the removal of periapical cysts. However, this approach can be carried out to the dental preservation.

**Keywords:** Endodontics; Tooth Replantation; Periapical Cyst.

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**DEEP BITE TREATMENT IN MIXED DENTITION. CASE REPORT*****Tratamento de mordida profunda em dentição mista. Relato de caso.***

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The deep bite is a malocclusion characterized by the excessive vertical trespass of the upper anterior teeth. A male patient 7 years old, mixed dentition, brachyfacial with overbite occlusion. During the dentist appointment, he reported sensitivity in the anterior palate during mastication, caused by the contact of the lower teeth. The treatment plan was immediate intervention by planas indirect tracts orthopedic appliance over a period of 8 months to stimulate maxillary and mandible growth, to correct the overbite and consequently, to provide comfort and balance during the chewing process. The treatment induces changes in the mandibular morphology, correcting the deep bite and mandibular dynamics, thus improving masticatory function. The patient is in the facial growth phase and is being clinically controlled every six months to monitor facial growth and dental development

**Keywords:** Mixed dentition; Overbite.

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**TREATMENT OF TRANSVERSE MAXILLARY DEFICIENCY AND MAXILLARY PROTRACTION IN A PATIENT WITH MIXED DENTITION****Tratamento de deficiência maxilar transversal e protração maxilar em paciente com dentição mista**

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The diagnoses of dental malocclusion should be performed precociously when possible preferably in mixed dentition, when treatment has greater orthopedic effects over unwanted dental effects. Returning the esthetics to the patient implies contributing to their appearance taking into account the psychological and social factor. The report case of a female patient, 11 years old referred for treatment in the clinic FACSETE - ORTOGEO Unit - São José dos Campos, during the patient's anamnesis complaining about the esthetics of the teeth and difficulty to smile. The intraoral examination revealed mixed denture, transverse maxillary deficiency and anterior cross-bite. Orthopedic treatment was maxillary disjunction associated with maxillary protraction (the device used was the disjunction McNamara associated with Petit face mask). The device was used to advance the maxilla and to remodel the cranio-maxillary sutures, while the mandible rotated clockwise, correcting the concavity of the soft tissue, improving facial aesthetics. The maxillary reverse traction therapy with face mask associated with disjunction has been reported to be beneficial and safe for the correction of transverse and sagittal maxillary deficiencies.

**Keywords:** Mixed dentition; Malocclusion.

**DYSESTHESIA AFTER EXTRACTION OF IMPACTED MANDIBULAR THIRD MOLAR: CASE REPORT**  
***Disestesia após exodontia de terceiro molar mandibular impactado: relato de caso clínico***

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Third molar extraction is one of the most common procedures in the dentist's clinical daily practice; however, like any surgical procedure, it has complication rates. These include dysesthesia which results from a lesion that directly affects the somatosensory system, leading to abnormally painful sensations in the region. This case is from a 22-year-old female patient who performed teeth extraction of the 38 and 48 elements near the mandibular canal, at the Department of Diagnosis and Surgery, School of Dentistry of S.J.Campos (ICT-UNESP). In the 7-day postoperative period after tooth 48 extraction, she reported strong pain, irradiated and intermittent painful sensations, with diagnosis of lower alveolar nerve dysesthesia. Prednisolone 60 mg/day drug therapy was prescribed, and the case was followed for one month, with weekly returns for low-level laser application, checking general conditions and regression of symptoms. On return, considerable regression of symptoms was reported and on the last return, complete regression of pain, no longer configured as an uncomfortable condition. Management of this complication is not always simple, and there is no universal

protocol for treatment, but early diagnosis and treatment of dysesthesia is beneficial to the patient and has important ethical and legal implications

**Keywords:** Dysesthesia; Third Molar; Mandibular Nerve; Oral surgery.

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Case report

#### **VERTICAL EXTRACTION - CLINICAL CASE**

##### ***Exodontia vertical- caso clínico***

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With the evolution of implant dentistry and the need for bone preservation, different techniques and materials are emerging in order to favor the rehabilitation of patients. The aim of this report is to present a clinical case of vertical extraction of right upper central incisor with the use of Bioextractor Quinelate. A 39-year-old male patient sought care at the ICT / Unesp Buccomaxillofacial Surgery and Traumatology Clinic for extraction of the element 11. Due to the compromised aesthetic area, it was performed with the Bioextractor, from Quinelato Instruments Surgicos, in order to perform a minimally traumatic extraction, to maintain the integrity of the bone boards favoring the aesthetic region for subsequent rehabilitation with dental implant. The surgical technique consists of the initial procedures as standard, while the extraction was performed after locking the standard screw in the root canal of the tooth, positioning the support silicones followed by vertical pull by the extractor, in a single and continuous movement. After extraction, the preserved bone corticals were maintained and the patient was able to undergo implant rehabilitation. Thus, it was concluded that vertical extraction is necessary in aesthetic cases and the new instruments to perform the technique are facilitators and of great value.

**Keywords:** Dental extraction; Dental Implants; Oral surgery.

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Case report

#### **LOW INTENSITY LASER IN ROOT COVERAGE ASSOCIATED WITH CONNECTIVE TISSUE GRAFT TECHNIQUE: CASE REPORT AFTER 5 YEARS OF TREATMENT**

##### ***Laser de baixa intensidade no recobrimento radicular associado à enxerto de tecido conjuntivo: relato de caso após 5 anos de tratamento***

Bautista CRG, Dias-Fernandes SB, Neves FLS, Santamaria-Mathias IF, de Marco AC, Santamaria MP  
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Gingival recession (GR) is defined as the apical shift of the gingival margin and consequent exposure of the root surface. This condition has a high prevalence in the Brazilian population. The aim of this case report study was demonstrated the long-term effect of the use of low-intensity laser (LIL) as an adjuvant therapy to root coverage procedure in a female patient, 38-year-old, systemically healthy, presenting RT1 GR with 3 mm of length affecting maxillary

canine was referred to the Periodontology Clinic, UNESP - São Paulo State University (São José dos Campos, Brazil) complaining about esthetic problems. Aiming to resolve this condition, surgery for root coverage was performed by means coronally advanced plus connective tissue graft, which is considered the gold standard in the literature, associated with the use of LIL to photobiostimulate and to accelerate the wound repair. A diode laser (GaAlAs, 660 nm) was applied immediately after surgery and once every 2 days for 14 days (8 applications). At 6-month, 1, 2 and 5-year follow-up was observed complete root coverage and gain of height and thickness of keratinized tissue. The evaluations showed satisfactory esthetic and functional results, indicating that this protocol is safe and predictable when well indicated and accompanied by patient cooperation.

**Keywords:** Gingival recession; Lasers; Dental esthetic.

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Case report

### **MULTIPLE EXODONTIES IN PATIENT WITH OSTEORADIONECROSIS: CASE REPORT**

#### ***Exodontias múltiplas em paciente com osteoradionecrose: relato de caso***

Silva CD, Carvalho VG, Silva RMT, Collino L, Arruda T, Nascimento RD, Raldi FV, Moraes MB  
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The aim of this study was to present a clinical case of multiple extraction in a patient with osteoradionecrosis associated with osteomyelitis, after undergoing head and neck radiotherapy to treat laryngeal cancer. A 61-year-old male patient sought treatment at ICT / Unesp Buccomaxillofacial Surgery and Traumatology clinic, after several unsuccessful dental treatments, and the persistence of painful symptoms. With the need to improve the quality of life and stop the infectious focus, a drug treatment associated with surgery was planned. The drug therapy started 60 days before, and was the combination of Pentoxifylline 400mg and Tocopherol 500 IU, soon after, the extraction of all teeth and remnants of the oral cavity were performed, aiming the prosthetic rehabilitation. The extractions were performed in 4 stages, after broad spectrum antibiotic therapy, being successfully completed and perfect healing. The patient is without pain and without infectious focus, undergoing the prosthetic rehabilitation. Thus, despite the fact that dental management after radiotherapy is controversial, especially with regard to surgical treatment, the protocol used in this case was effective and provided good results and improved the patient's health and quality of life.

**Keywords:** Head and neck cancer; Osteoradionecrosis; Oral surgery; Medical oncology.

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Case report

### **MINIMALLY INVASIVE PROTOCOL FOR ESTHETIC RESOLUTION OF TETRACYCLINE STAINED TEETH - CASE REPORT**

#### ***Procedimentos minimamente invasivos para resolução estética de manchamento dental por tetraciclina - relato de caso clínico***

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The aim of this study was to report a minimally invasive protocol for the esthetic resolution of severe tetracycline stained teeth. A 43-year-old female patient was attended at the Dental Clinic of Institute of Science and Technology - UNESP, because she was dissatisfied with the esthetics of her teeth. During anamnesis and clinical examination, dental staining by tetracycline and incisal edge wear of the anterior superior teeth were diagnosed. To solve the problem, the patient was submitted to at-home bleaching with 10% carbamide peroxide for 6 months. After this period, two in-office bleaching sessions were performed in the resistant bands, with 35% hydrogen peroxide. Subsequently, the incisal edge was re-anatomized and the cervical region was covered with composite resin. Both procedures were performed without dental abrasion. After one year of clinical follow-up, the protocol result is stable and the patient is satisfied with the treatment. It is concluded that minimally invasive procedures may be required to resolve cases of tetracycline stained in which esthetics are aimed.

**Keywords:** Tooth Bleaching; Tetracycline; Dental Esthetic.

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Case report

#### **ARTIFICIAL AND HUMAN INTELLIGENCE INTEGRATION FOR PLANNING AND TREATMENT WITH CAD/CAM CERAMIC VENEER.**

*Integração da inteligência artificial e humana para planejamento e tratamento restaurador com laminados cerâmicos cad-cam*

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The aim of this study was to relate a clinical case of ceramic veneer with the CAD/CAM system, for the optimization of smile, with the aid of 3D digital planning. A 53-year-old patient, with a major complaint of smile esthetic dissatisfaction, was attended at the ICT UNESP. Erosion lesion in the anterior teeth and one provisional crown were observed during the clinical examination. Different treatment steps were explained to the patient, followed by composite resin or ceramic laminate restorations, as well as their advantages and disadvantages. She opted for the realization of ceramic veneers. Photographs were obtained and stone models were scanned for the 3D aesthetic planning using the Exocad software. After the digital wax, the model was printed for functional and aesthetic tests using the mockup technique. The preparation for the veneers was conservative, guided by silicone guides. The teeth were prepared, the models were scanned and the restorations were drawn following the digital waxing. The restorations were milled, crystallized and characterized by the prosthesis technician, with subsequent cementation under modified isolation. The occlusion was checked and the patient was instructed about the care and maintenance of the restorations. At one year control, it was observed the maintenance of the positive result achieved at the first control. It was concluded that the achieved aesthetic returned a harmonious smile, the self-esteem and confidence of the patient.

**Keywords:** CAD-CAM; Ceramics; Dental Veneers.

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Case report**AESTHETIC AND FUNCTIONAL REHABILITATION ASSOCIATED WITH CERAMIC VENEERS AND DIRECT COMPOSITE RESIN RESTORATIONS: CASE REPORT***Relato de caso: reabilitação estética e funcional associando laminados cerâmicos e restaurações diretas resina composta*Silva RMT, Carvalho VG, Uemura ES, Pierre FZ, Mocelin RC, Silva JMF  
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The aim of this study was to present a clinical case of aesthetic rehabilitation of the upper anterior tooth with ceramic veneers associated with direct composite resin restorations. A 21 - year - old female patient attended by the PROAC - ICT - UNESP Clinic with the aesthetics issue, the presence of diastema between the upper teeth and discoloration of the element 11 due to previous endodontic treatment. The criteria for a harmonious smile were done by smile digital planning. With the approval of the planning, it was indicated four ceramic laminates veneers in the elements 11,12,21,22 and resin composite veneer of the elements 13 and 23, solving the aesthetic and functional problems from the reestablishment of the anterior and canine guides. The procedure has been successfully executed and the follow-up of two months performed. Thus, a combination of techniques and materials can improve clinical outcome and decrease the cost of treatment.

**Keywords:** Dental veneers; Composite resins; Aesthetics.32  
Case report**THE IMPORTANCE OF EARLY DETECTION OF POTENTIALLY MALIGNANT DISORDERS IN THE PREVENTION OF ORAL CANCER***Importância do diagnóstico precoce das desordens potencialmente malignas na prevenção do câncer de boca*Rodrigues NS, Carvalho BFC, Alves MGO, Alves MS, Ribeiro JL, Kaminagakura E, Anbinder AL, Almeida JD  
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Leukoplakia is a clinical term for lesions that present as a whitish plaque in the oral mucosa that cannot be characterized clinically or histopathologically as any other disease. The detection importance is related to its association with oral squamous cell carcinoma. A 55-year-old female smoker attended the Stomatological Propedeutics Clinic complaining of tongue lesion. The patient reported that 5 years ago she had noticed a smaller lesion at the same site, which had increased in size with painful symptoms. In the intra-oral clinical examination, a white plaque of approximately 2.0 cm in extension on the left lateral tongue border was observed, being homogeneous in the posterior region, well delimited and with smooth surface; and slightly ulcerated in the anterior region, non-homogeneous, with rough surface and firm to the palpation. Incisional biopsies of both areas were performed with the diagnostic hypothesis of leukoplakia and squamous cell carcinoma, respectively. Histological sections revealed a malignant epithelial neoplasia with intense cellular and nuclear pleomorphism. Islets of pleomorphic epithelial cells and some isolated cells were observed

invading the superficial region of the lamina propria. With the final diagnosis of squamous cell carcinoma, the patient was referred for cancer treatment. The case highlights the importance of early diagnosis of potentially malignant disorders.

**Keywords:** Leukoplakia; Carcinoma; Squamous cell; Neoplasms.

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Case report

#### **NON-HODGKIN LYMPHOMA DIAGNOSED AS DENTAL ABSCESS: AN ALERT TO DENTISTS!**

***Linfoma não-hodgkin diagnosticado como abscesso dentário: um alerta para o cirurgião dentista!***

Carvalho BFC, Rodrigues NS, Moraes RM, Ribeiro JL, Kaminagakura E, Carvalho YR, Anbinder AL, Almeida JD  
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The aim of this study is to present a case of a diffuse large B-cell lymphoma (DLBCL) in the mouth. A 41-year-old male reporting pain and discomfort in the maxilla for 2 months, having used nimesulide on his own, without improvement. The patient sought a private dentist that established a diagnosis of dental abscess, prescribed antibiotic for 2 weeks and indicated the extraction of the third upper molar. In the absence of symptoms improvement, the patient sought care in the clinic of Stomatological Propedeutics of ICT-UNESP. Extraoral examination revealed slight facial asymmetry and increased right submandibular lymph node that was asymptomatic and firm on palpation. Intraoral examination revealed a lobulated and reddish nodule, with ulcerated surface, soft and asymptomatic on palpation, measuring about 2.5 cm in diameter, located in the posterior alveolar ridge of right maxilla. The clinical differential diagnoses were lymphoma and fibrosarcoma and incisional biopsy was taken. Histopathological examination revealed a round and blue cells proliferation, compatible with lymphoma. Complementary immunohistochemical examination was positive for CD20 and BCL6. The patient was referred for oncology treatment, received chemotherapy and recently is in complete remission of the disease. This case emphasizes that earlier diagnosis of DLBCL is of paramount importance for prognosis. Thus, dentists should always be alert to perform a correct anamnesis and a complete clinical examination on their patients.

**Keywords:** CD20 antigens; Oral diagnosis; Non-hodgkin lymphoma; Head and neck neoplasms.

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Case report

#### **RAPID MAXILLARY EXPANSION IN PATIENT WITH CANINE IN INFRA VESTIBULOVERSION**

***Expansão rápida da maxila em paciente com canino em infra vestibuloversão***

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The Rapid Maxillary Expansion is a clinical procedure that utilizes activation of Palatal Expanders to achieve midpalatal suture opening. The patients indicated for this type of procedure are those who have maxillary deficiency and bone base hypoplasia. This study

presents the clinical case of a 9-year-old male patient, with maxillary atresia, bilateral crossbite, and upper left canine in infra vestibuloversion. The HYRAX device was used, following the activation protocol being 4 initial turns (first day), and 2 turns per day (morning/night), with weekly appointment to evaluate the performance of the case evolution. The patient presented diastema between 11 and 21 confirming suture opening, obtained 9 mm opening with the maxillary disjunction, consequently the maxillary transverse gain correcting the crossbite and the incisor's ratio. After completion of the activations, the HYRAX device served as orthodontic containment and the conventional fixed orthodontic appliances was used to obtaining alignment and leveling of the arches and traction of the canine. Well planned and executed Rapid Maxillary Expansion led to a satisfactory result.

**Keywords:** Maxillary expansion; Orthodontic appliances; Maxillary bone.

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Case report

#### **IMAGINOLOGICAL FINDINGS OF TMJ AND CLINICAL APPROACH IN THE PATIENT WITH SYSTEMIC SCLERODERMA: CASE REPORT**

*Achados imaginológicos de atm e conduta clínica em paciente com esclerodermia sistêmica: relato de caso*

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Scleroderma is an autoimmune disease that directly affects the production of collagen in connective tissue. The disease in a systemic form affects the internal system of organisms and skin, and may have oral and perioral manifestations. The disease has some radiographic signs, such as periodontal ligament thickening, bone resorption of the mandible, and bone resorption of the terminal phalanges. Bone condylar resorption is present in about 20% of scleroderma cases, as well as TMJ disorders. This case report aims to warn about the radiographic findings of the disease, as well as to demonstrate the need for a multidisciplinary team to perform the treatment and an adequate planning. The patient in question was already in dental care at the ICT / Unesp when a panoramic radiograph showed marked bone resorption in the left condyle, and was promptly transferred to the Occlusion and Temporomandibular Joint Center, where she was diagnosed and treated with a myorelaxant occlusal plate to relieve internal joint pressure and the patient was referred for evaluation by a maxillofacial surgeon. The decisions made have a great impact on the health and life of scleroderma patients, so there is a need for multidisciplinary involvement in order to arrive at the best treatment plan. After two months of use of the plate, the patient reports greater comfort and muscle relaxation upon waking.

**Keywords:** Systemic scleroderma; Oral health; Temporomandibular joint disorders; Diagnostic imaging.

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**MESA DEMOSTRATIVA: ESCULTURA DENTAL*****Demonstration table: dental sculpture***

Rocha CT, Moreira-Júnior C, Lopes RS, Faria V, Silva RM, Yui KCK, Borges AB, Gonçalves SEP, Torres CRG, Pucci CR  
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The purpose of the demonstration tables was to facilitate the assimilation of the regressive sculpture steps performed in wax blocks by the students in the full-time 2nd period and the evening 3rd period of dentistry course - ICT UNESP-SJCampos in Occlusion and Sculpture classes. Demonstrative tables of the incisors, canines, premolars and molars were made. The steps were adapted from Santos Jr and Fichman: a) clipping of free, proximal and occlusal views; b) demarcations of the lines of greater incised (or occluded) - apical contours and the bumps; c) Expulsive areas; d) retentive areas for completion of the geometric phase and subsequently rounding to finish the tooth carving. Initially, a cast of all the teeth carving steps was made and cast in type II plaster, then white paint was applied, the incised (or occluded) apical lines were demarcated and finally a varnish was applied to waterproofing it. It was noticed with the demonstration tables that the students were able to assimilate the steps with greater objectivity to perform the dental sculpture in three dimensions, improving learning and teaching, besides verifying a greater development of the students regarding dental sculpture.

**Keywords:** Sculpture; Dental Morphology; Teaching Methods.

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**DIAGNOSTIC CONSIDERATIONS ABOUT CALCIFYING EPITHELIAL ODONTOGENIC TUMOR*****Considerações diagnósticas do tumor odontogênico epitelial calcificante***

Godoi FHC, Oliveira IJ, Araújo JCR, Ribeiro JL, Moraes RM, Anbinder AL  
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Calcifying epithelial odontogenic tumor is a benign tumor that comprises less than 1% of odontogenic tumors. Radiographically, it presents as a radiolucent unilocular or multilocular image, with well-defined borders and with or without radiopaque foci, often associated with a non-erupted tooth. Treatment may be performed by enucleation and curettage or by employing resections with safety margins. The aim of this study was to discuss the importance of histopathological diagnosis, the biological aspects of calcifying epithelial odontogenic tumor, its diagnosis and treatment through a case report. A 44-year-old Caucasian patient was referred for mandibular radiolucent lesion treatment after previous diagnosis of ameloblastoma by a non-dentist pathologist. Imaging examination revealed a large lesion associated with tooth #38, causing root resorption of #37, with presence of radiopaque areas. A new biopsy was performed, and islands of odontogenic epithelium, composed by polygonal cells with eosinophilic cytoplasm and well-stained basophilic nucleus, sometimes with evident epithelial junctions and slight cellular pleomorphism were observed. Around the islets, and also among the epithelial cells, amorphous amyloid-like material was confirmed by Congo red

staining. With the final diagnosis of calcifying epithelial odontogenic tumor, the patient was referred for treatment by surgical enucleation with a small peripheral safety margin.

**Keywords:** Odontogenic tumors; Diagnostic Imaging; Biopsy; Benign neoplasm.

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Case report

**AESTHETIC REHABILITATION BY MAXILLOFACIAL NASAL PROSTHESIS: CLINICAL CASE**  
***Reabilitação estética buco maxilofacial por meio de prótese nasal: caso clínico***

Silva CA, MA Camargo, GO Barbosa, Fontes FC, Santos LM, Borges ALS  
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Loss of the nasal appendix is known to cause significant facial deformity. Understanding how a person with mutilation, traumatic or pathological cause, handles, behaves or interacts instigates researchers and clinicians about the possibilities of rehabilitation and reintegration of the individual in society. The nasal prosthesis is the treatment modality to restores facial contour, protecting remaining structures and keeping the mucosa lining the passage of air moist. We report here the rehabilitation of a patient treated at ICT-UNESP, with the manufacture of individualized acrylic resin nasal prosthesis that was characterized giving the patient psychological and rehabilitative benefit. Patient L.R. age of 65 years, loss of nasal structure by Mucocutaneous Leishmaniasis. After obtaining the alginate facial impression and plaster cast, a model person was used to obtain the plaster nose. The model was isolated and an initial layer of 0.5mm of acrylic resin was obtained, followed by layer by layer application to gain thickness. Thus, the prosthesis was adjusted in the face for texture, color and kept in position fixed to the frame of the patient's glasses. The lost wax technique was not performed, because including it in muffle the prosthesis would be dense and heavy, opting for this modification of the technique. Being oriented about hygiene and care and subsequent follow-up, the preparation of the nasal prosthesis allowed the patient to improve their quality of life and their social reintegration.

**Keywords:** Mucocutaneous leishmaniasis; Acrylic resin; Maxillofacial prosthesis.

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Case report

**FLIPPED CLASSROOM: an experience on Histology teaching**  
***Flipped classroom: uma experiência na disciplina de histologia***

Ferreira JM, Lima VAB, Araújo JCR, Miranda KC, Vegian MRC, Vasconcellos LMR, Salgado MAC, Spalding M  
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Flipped Classroom is a pedagogical method which proposes that low cognitive activities (such as understanding and remembering) can be performed at home, while the most challenging activities are developed in the classroom. It will provide additional time to the professor to work with the students and to improve the concepts as well. The aim of this study is to present a case developed at the ICT- UNESP Histology Discipline of São José dos Campos, SP, BR. The

first steps of the course is that the students should have the knowledge of histological processing techniques, so they can understand the learning methods and will know how to interpret histological factors. It will allow to correlate with the course content. Therefore, at the beginning of the course, the students will be asked to watch a YouTube video about histological techniques. Then, the day of the course, the students will be sitting in different groups which the stages of histological techniques should be simulated. The classroom supplies will be provided such as cardboard boxes, scissors, colored pens and other materials to explore their creativities for each step. Then, each group will present to their classmates their projects. Consequently, the professor will help to understand the content, to address misconceptions and to provide useful feedback. The good value of Flipped Classroom is what you do in the classroom. It's the second consecutive year of developing this activity by this discipline. Besides promoting a playful and fun moment for the whole group, it's hand on the concepts acquired before the classroom.

**Keywords:** Students, Dental; Histology; Teaching; Flipped classroom.

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Case report

**REANATOMIZAÇÃO INCISAL COM RESINA COMPOSTA PARA OBTENÇÃO DE GUIAS DE DESOCCLUSÃO EM PACIENTE COM BRUXISMO: RELATO DE CASO CLÍNICO**

***Incisal edge restoration with composite resins to obtaining disocclusion guidances in bruxism patient: Case report***

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Dental wear is a multifactorial problem, and bruxism is one of the most frequent causes in the contemporary practice. Bruxism compromise teeth function and aesthetics, by excessive wear on incisal and occlusal surfaces. Different treatment protocols can be used to reestablish the loss of tooth structure to assist the bruxism control, and the use of direct composite resin restorations associated with occlusal plate and emotional follow-up is an appropriate and conservative option. This restorative approach is capable of good clinical longevity, predictability, dental tissue conservation and low cost, although it requires considerable technical skills. Thus, the aim of the present study was to describe the treatment and three-month follow-up of a conservative approach to restore the aesthetics and function of the worn anterior upper teeth of a young patient with the use of direct composite resin and occlusal plate. The restorative planning was performed with semi-adjustable articulator and diagnostic wax-up. After three months of follow-up, it was possible to evidence that the functional and aesthetic clinical success, with disocclusion guidances and stabilized occlusal pattern.

**Keywords:** Composite resin; Bruxism; Occlusal Splints.

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Case report

**NON-SURGICAL TREATMENT OF SKELETIC CLASS III PATIENTS**  
***TRATAMENTO NÃO CIRURGICO DE PACIENTES CLASSE III ESQUELÉTICA***

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Treatment of skeletal Class III patients usually involves surgical intervention, but many patients seek alternatives, evaluating risks and costs of such procedure. The present study aimed to report a case of compensatory treatment for Class III malocclusion without surgical intervention. A 17-year-old patient, convex profile, dental and skeletal class III, top anterior bite, lingual interposition and Bolton discrepancy in upper arches presented at the Ortogeo-São José dos Campos Orthodontics Clinic and was treated with SLI self-ligating brackets (Morelli), heat-activated nickel-titanium and stainless steel sequence of orthodontic wires. The treatment was made with Class III elastics, distal fold and steel ligature to prevent mandibular incisors proclination, a lingual spur to reduce lingual interposition and aesthetic treatment of upper lateral incisors. It was possible to observe after a few months of treatment an occlusion close to the ideal, with canines in good relation and more harmonic profile without surgical treatment. We conclude that compensatory treatment in skeletal Class III patients without severe craniofacial anomalies is possible through careful planning and precise biomechanical control, being safe and effective in this case.

**Keywords:** Angle Class III; Dental Occlusion; Corrective Orthodontics.

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Case report

#### **BUCOFARINGEAN OBTURATOR PROSTHESIS IN ONCOLOGICAL PATIENT: CASE REPORT**

*Prótese obturadora buco faríngea em paciente oncológico: relato de caso*

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Approximately 40% of head and neck cancers occur in the oral cavity according to data from the National Cancer Institute (INCA, 2011), and their incidence is more evident in males. This region englobes different anatomical structures, including oral mucosa, gums, hard and soft palate, oral tongue and floor of mouth. Surgical procedures for tumor removal as well as other associated therapeutic procedures, usually generate temporary or definitive mutilations for the patient. Rehabilitation with obturator prosthesis is a complementary treatment option in cases where additional surgical procedures are contraindicated. The size and location of the defect influence the difficulty degree in rehabilitation. This clinical report describes the prosthetic rehabilitation (with pharyngeal buccal obturator prosthesis, reinforced with a fiberglass mesh) of a patient submitted to palate tumor excision for treatment of squamous cell carcinoma in the left posterior palate region. The importance of rehabilitation through the obturator prosthesis is because the prosthesis restores the masticatory function, improves speech, swallowing and aesthetics of these patients, thus returning quality of life.

**Keywords:** Medical oncology; Mouth Neoplasms; Mouth rehabilitation.

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**ADHESIVELY FIXED CENTRAL INCISOR PROsthESIS IN ADOLESCENT PATIENT: CASE REPORT*****Prótese fixa adesiva em central de paciente adolescente: relato de caso***

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The concept of minimally invasive dentistry can be defined as the maximum preservation of healthy dental structures. With the innovation of adhesive techniques, it was possible to preserve these structures during restorative procedures. Adhesive fixed partial dentures (FPD) are a viable alternative for missing tooth replacement because they are inexpensive, fast and easy to perform and minimally invasive when compared to conventional FPD. Associated with a reinforcing material, such as glass fibers, they support chewing loads, increasing the flexural strength of composites. This study aimed to conduct a case report with a fiberglass reinforced composite resin adhesive FPD in the anterior region of an adolescent patient, aiming at preserving the structures of the adjacent teeth in the preoperative period (implant), returning aesthetics and function. To make the prosthesis, anterior partial molding of the upper arch was performed; in a plaster model, the complete waxing of the element 21, the mesial element 11 and the support fins on the lingual tooth 11 and 22 were made which was later molded with silicon to guide the preparation of the prosthesis indirectly with CR and fiberglass. The piece was tested and cemented with flowable resin. With the installation of the prosthesis, the function was restored without neglecting the importance of the patient's aesthetics, improving their self-esteem and quality-of-life during the completion of this growth period before the implant installation.

**Key words:** Dental prosthesis; Composite resins; Post and Core Technique; Adolescent.

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**MODIFIED IMPRESSION TECHNIQUE IN CASE OF LIMITATION IN OPENING MOUTH: CLINICAL REPORT*****Técnica diferenciada de moldagem para caso de extrema limitação de abertura bucal: descrição de caso clínico***

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One of the most important stages of a prosthetic rehabilitation treatment is the molding of maxillary arch. Different techniques have been implemented to determine a faithful copy of the buccal structure, linked to each technical planning. One of the barriers to execute correctly this operative step, is the limitation in opening mouth, consequently, it becomes difficult to mold the areas that are important to the prosthetic. This restriction can be caused by the systemic order issue, such as patients that presents scleroderma condition or autoimmune disease, that causes through the time a progressive action on the body collagen, which makes soft and stiffened tissues, in which includes the orbicular region of the lips and cheek. This aim of this study was to exemplify with a clinical case of scleroderma, which needed the buccal rehabilitation for the upper removable partial denture. Patient presented a limitation in

opening mouth, which difficult the molding process. Therefore, was developed a mold with different characteristics in its design that allows access and removal of the buccal cavity without losing fundamental aspects to the copy of the arch. The thorough sequence of the execution of this step till the resolution had been crafted with great achievement. As a result, the viability of the deploy of this new technique of molding, that it can be used in other similar clinic conditions.

**Keywords:** Dental Impression Technique; Systemic Scleroderma; Mouth Rehabilitation.

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Case report

#### **ORTHODONTIC TREATMENT WITH SELF-LIGATING BRACKETS FOR CCO PRESCRIBING AND REMOVAL OF FIRST PERMANENT MOLARS**

*Tratamento ortodôntico com braquetes autoligantes de prescrição cco e exodontia de primeiros molares permanentes*

De David CA, Felamingo I, Nobrega C, Kozel JAA  
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Selective extractions are classic complementary therapies in orthodontics to gain space in the dental arch. They can be performed symmetrically or asymmetrically according to the need for resolution of each malocclusion. The objective of the present study was to report the case of a female patient, 14 years and 2 months, with moderate crowding, dental class II, treated orthodontically by straight wire technique with self-ligating CCO prescription brackets. Dentsply gac (0.022 "slots), aided by sentalloy and bioforce wires and submitted to the extraction of first permanent molars. The case planning required multidisciplinary knowledge based on the patient's clinical condition, which had imperfect enamel amelogenesis in permanent dentition, canine in infra vestibule version and advanced caries. The patient was also submitted to laser exposure of third molar crowns that were present and viable. At the end of treatment, there was no harm to the patient because the loss of anchorage without the use of extra accessories and the use of third molars as adjuvants in the replacement of extracted elements was successfully performed. It was concluded that the extraction of first permanent molars using the prescription CCO Dentsply gac combined with good prior planning proved to be efficient and safe in solving this case.

**Keywords:** Tooth Extraction; Orthodontic Anchorage Procedures.

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Case report

#### **CERAMIC LAMINATES IN AESTHETIC REHABILITATION: CASE REPORT**

*Reabilitação estética com Laminados Cerâmicos: Relato de caso clínico*

Rabelo JS, Silva JMF, Uemura ES, Penteado MM, Andrade DS, Sellan PB, Arcila LVC, Pereira LM  
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Recently, the search for aesthetics has been growing steadily and, at dentistry, it would not be different. Concomitantly with the rise of this search, the patient expectation and demand for

the ideal smile has also increased and to achieve a good result, a lot of knowledge and planning is required. This premise has developed new studies and technologies to achieve the best resistance, stability, biocompatibility and longevity results, thus promoting health. Finally, this case report describes the clinical sequence of an aesthetic rehabilitation case with four ceramic laminates in the upper incisors of a 25-year-old patient whose main complaint was based on discomfort with the size, shape, and diastema present in the teeth even after orthodontic treatment with recurrence.

**Keywords:** Dental veneers; Dental esthetics; Mouth rehabilitation; Dental prosthesis; Dentistry.

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Case report

#### **CLASS II TREATMENT WITH COMPLETE CLINICAL ORTHODONTICS (CCO) SELF-LIGATING SYSTEM**

##### ***Tratamento classe II com sistema autoligante cco (complete clinical orthodontics)***

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This case report presented a deep bite Angle class II with severe upper and lower anterior region crowding forming an occlusal compensation in the region and a Class III effect in canines in a female 32-year-old adult patient. The planned treatment was effective through the CCO (Complete Clinical Orthodontics) self-connected system, using a sequence of arcs, starting with the Sentalloy 0.16", moving on to the Bioforce 0.20" x0.20" arch for alignment and leveling, and performing the expression of 304 VAR 0.19"x0.25" premium steel arc torque coupled with Class II elastic for Angle Class I correction and Class I canine ratio, being arch-finished Multibraid 0.17"x0.25" in the intercuspatation process.

**Keywords:** Angle Class II; Orthodontics; Malocclusion.

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Case report

#### **CLASS III TREATMENT WITH DISJUNCTION, PROTRACTION AND ERTTY GAPIII® APPLIANCE.**

##### ***Tratamento da classe III com disjunção, protração e aparelho ertty gapIII®***

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The incidence of patients with class III molar relationship happens relatively frequently. The treatment of class III malocclusion is challenging due to the genetic component. Usually, the treatment of choice in these cases is the maxillary protraction protocol with Petit mask preceded or not by rapid maxillary contraction and expansion. This panel reports a case report of an 11-year-old skeletal class III patient with anterior open bite with no space for teeth 13 and 23. A palatal disjuncter for rapid maxillary expansion and maxillary protrusion mask was chosen. However, the maxillary traction caused the mesialization of the posterior teeth

impacting the upper canines. As a space clearance solution for the upper canines, the Ertty GAP III® appliance was installed.

**Keywords:** Angle Class III Malocclusion; Orthodontics.

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Case report

**BILATERAL LATERAL INCISOR AGENESIA WITH CANINE REANATOMIZATION*****Agnesia bilateral do incisivo lateral superior com reanatomização de canino***

Felamingo I, Kozel JAA, David CA  
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Approximately 2% of the population is affected by maxillary lateral incisors agenesis, a congenital change that can be observed during the change from primary to permanent teeth. Case planning should aim at aesthetics and satisfactory function as well as long-term stability. Treatment options include maintaining space for prosthetic replacement or closure through mesialization followed by canine reanatomization. When the option is for space closure, it is argued that this treatment brings immediate results after the removal of the orthodontic appliance. This change can be corrected even in adolescence, without the need for space maintainers or temporary prostheses. A viable, cost-effective and safe procedure offers satisfactory results in aesthetics and long-term function. Thus, the objective of this study was to present a clinical case of bilateral maxillary lateral incisor agenesis in which the treatment option chosen was space closure through the mesialization of the posterior elements. The treatment plan consisted of canine reanatomization and correction of the canine torque to resemble the lateral incisor torque, along with the correction of the first premolar torque to resemble the canine torque. This was accomplished by orthodontic mechanics with orthometric upper and lower self-ligating fixed braces, Straight Wire technique, in which the lateral incisor bracket was installed on the canine and the canine bracket installed on the first premolar.

**Keywords:** Anodontia; Incisor; Diastema; Orthodontic.

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Case report

**PERMANENT MOLAR EXTRACTION IN ADULTS PATIENTS*****Extração de molares permanentes em pacientes adultos***

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The treatment was performed using the In-ovation R self-ligating fixed orthodontic appliance in the GAC Dentsply CCO prescription. It was decided to extract the molars that were compromised (36 and 46) using the space to align and level the anterior portion of the arch as the upper arch also presented excessive space by dental mutilation of second premolars and permanent first molars. After aligning, leveling and establishing correct ratios in the anterior portion of the dentition, we opted to mesialize the posterior teeth to finish closing the

remaining spaces. We also opted for the traction of the lower third molars that were included to occupy the second molar position. Finally, we used intermaxillary elastics to correct the canine and molar relations.

**Keywords:** Orthodontics; Tooth Extraction; Molar.

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Case report

**MUCOCELE WITH A GREAT NUMBER OF MULTINUCLEATED GIANT CELLS: AN UNCOMMON CASE REPORT**

*Mucocele com numerosas células gigantes multinucleadas: relato de um caso atípico*

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Mucocele is a common non-neoplastic lesion of salivary gland origin that occurs in mouth, most often in the lower lip of young individuals. Although clinical and histological characteristics are well-defined, histological variations can rarely be found, which can cause difficulties during diagnosis. We reported a case of mucocele with an increased number of multinucleated giant cells lining the pseudocystic cavity. A 25-year-old caucasian female patient presented with a 1-cm nodule, with smooth surface, in the lower lip. With the clinical hypothesis of mucocele, an excisional biopsy was performed. Histopathological examination revealed a cavity coated by granulation tissue with many macrophages and multinucleated giant cells (CD68 positive and A1E/AE3 negative) surrounded by a connective tissue fibrous capsule. Granulomas with many macrophages and foreign body giant cells could be seen in the lamina propria. The final diagnosis was mucus extravasation phenomenon (mucocele). The presence of multinucleated giant cells and granulomatous inflammation is rare, occurring only in about 1% of cases of mucocele, although these characteristics do not influence the prognosis and the treatment of the lesion. However, the knowledge about this variant is very important to proper diagnosis and treatment

**Keywords:** Mucocele; Oral pathology; Multinucleated giant cells.

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01

University Extension

**ORAL HEALTH EDUCATION: EVALUATION OF A PREVENTION PROJECT FOR PUBLIC SCHOOLS*****Educação em saúde pública: avaliação de um projeto de prevenção para escolares da rede pública***

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Network about caries, periodontal disease and oral hygiene through a questionnaire and, afterwards to guide them on the main educational and preventive methods in oral health. 110 adolescents aged 11 to 16 years were evaluated and answered a questionnaire containing 20 questions, attended a lecture on brushing techniques, floss, diet and received guidance from two professionals. All students received a toothbrush, toothpaste and floss. Six months after the first orientation, the same students were reevaluated with the same questionnaire to verify the assimilated prevention content. In the first semester 94.5% of the students had knowledge about caries, in the second semester this number increased to 97.5%. Only 11.4% had knowledge about periodontal disease and after 6 months the percentage about it was 49.09%. The dentist was appointed as responsible for oral hygiene guidance by more than 72% of students in both questionnaires. The toothbrush, toothpaste and dental floss were the most used resources for oral hygiene by 45.8% of participants once the dental floss used by only 35% of the students. It can be concluded that the guidance by the dentist has a direct influence on the students' knowledge regarding oral health prevention, and there is a need to disseminate preventive measures in schools and reinforcing the importance of dental floss.

**Keywords:** Dental caries; Periodontal diseases; Oral hygiene; Cariogenic diet; Oral health.

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02

University Extension

**IMMERSION IN THE UNIVERSITY: YOU PROTAGONIST OF YOUR FUTURE*****Imersão na universidade: você protagonista do seu futuro***

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The ability to make decisions, have a critical view, develop autonomy and interpersonal skills are highly valued characteristics in today's society. Thus, was developed at ICT-Unesp of São José dos Campos, SP, Brazil, the Immersion Extension Course at the university: you protagonist of your future, aimed at high school students, with the objective of developing activities focused on the promotion of competences. socio-emotional. For three days, students were housed at the University, devoting themselves to the proposed activities. Lectures, dynamics, workshops and group discussions were organized, organized into 5 modules: "My generation: who am I and where am I going?"; "Master Chef Moment"; "Ethics: my new crush";

"Challenges trail and sense trail" and "Digital influencers and opinion makers". 27 high school students from 9 public schools participated. The support team consisted of 5 teachers, a

psychologist, 19 students from postgraduate, undergraduate and ICT-Unesp pre-university entrance exams. Promoting self-confidence is a way to help young people develop as protagonists in their own lives. The closing ceremony was filled with joy, respect, collaboration and testimonials full of thanks.

**Keywords:** Students; Social Skills; Courses; Universities.

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03

University Extension

**PROJECT DENTURES S.A.: TOTAL PROSTHETIC REHABILITATION TREATMENTS****Projeto dentaduras S.A.: tratamentos reabilitadores em prótese total**

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In recent decades, as the population has grown older, general health problems have also emerged, reflecting mostly in oral health, due to the partial or total loss of teeth. Therefore, in order to improve the life quality of patients, the use of conventional and implant-based full dentures becomes a satisfactory option and accepted by them. However, due to the high demand of the population in search of an adequate treatment plan at the Institute of Science and Technology (ICT-UNESP), and in order to increase students' learning with high-complex cases, the "Dentures S.A." project came up. The project is a community-based service that realizes rehabilitative treatments by total prosthesis means associated with other restorative treatment modalities and also oral maxillofacial prostheses. The target audience is attended and the work team is made up of undergraduate, dental technicians, speech/hearing care therapist, post-grad students and professors. During clinical treatments it is possible to rehabilitate patients with conventional or complex prostheses in a multidisciplinary way, therefore raising the learning level of students participating in the project. This project aims to work in an integrated manner, meeting a greater demand of patients and contributing to the learning of students.

**Keywords:** Complete denture; Mouth rehabilitation; Denture; Complete; Immediate.

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04

University Extension

**WINTER AT THE UNIVERSITY: SCIENCE FOR HIGH SCHOOL STUDENTS*****Inverno na universidade: ciência para alunos do ensino médio***

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Teaching, research and extension constitute the pillars that define the identity of major education courses. In this perspective, in order to strengthen relations between high school and university, ICT/Unesp proposed the course "Winter at the University", which aims to

demystify science, strengthen formation and introduce high school students to scientific initiation. The course takes place on vacation, during one week, during 40 hours. Different subjects are proposed, which stimulate students to question and study - in theory and practice - science-related content in various areas of knowledge, such as: molecular biology, scientific methodology, radiology, cosmology, microbiology, soil and cytology. Dissemination is done in schools and online, the students are selected through an essay. Over the past 7 years, 175 students have taken this activity. From this amount, 17 were awarded the PIBIC Junior. scientific initiation scholarship. In recent years there has been an increase in visibility, having been published in the media, by TV Vanguarda, Record and Bandeirantes and in the scientific community, at national and international congresses and symposia. This activity has already received an honorable mention at the Unesp Scientific Initiation Congress and was awarded for 2 consecutive years at the local Extension Forum. In addition, it articulates several levels of acting on campus, reaching 14 undergraduate students, 19 graduate students and 11 teachers. Actions of this nature contribute to the University's social and political mission towards society.

**Keywords:** University; Education; Science; Courses.

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05

University Extension

**MEO PROJECT "MORE THAN SEEING AND HEARING": ACTIVITIES IN ORAL HEALTH INCLUSION FOR VISUAL AND HEARING DISABLED POPULATION.**

***Projeto meo "mais do que enxergar e ouvir": ações de inclusão em saúde bucal para a população deficiente visual e auditiva.***

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This project is based on evidence from the communities and census data that reveal that a significant portion of the Brazilian population has some type of disability (hearing, visual, physical and intellectual). In recent years, isolated actions have promoted and implemented the inclusion of people with any type of disability or special need, aiming to rescue human respect and dignity. Taking into account the importance of oral hygiene care information being understood by all people, our group proposes didactic ways to pass on this information, allowing the inclusion of people with visual and hearing disabilities. The methodology is limited to the training of teams on the adequacy of sign language (Libras) with the team of the Association for the Hearing Impaired (AHI), and the elaboration of presentations in audiovisual form and by three-dimensional devices (macromodels and other playful devices) for those without vision or hearing in various degrees of illness, with a wide age range from children to adults. It is evident that the communities involved in this process have become the drivers of a local transformation of habits and awareness, spreading to other people and communities. In addition, the MEO project provides fundamental recycling of specific knowledge to our team, how to approach the issues within the limitations of each population, bringing this knowledge to reality in dentistry.

**Keywords:** Oral health; Education of hearing disabled; Education of visually disabled.

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**ORAL HEALTH QUIZ: CORRELATION BETWEEN EATING HABITS AND ORAL PROBLEMS.*****Quiz da saúde bucal: Correlação entre hábitos alimentares e problemas bucais.***

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The extension work aimed to guide the population regarding the relationship between food and oral health. An interactive game entitled “Oral Health Quiz” was developed, containing six questions relating to daily habits and oral care. The questions cover different classes of food, cultural practices, and oral hygiene. The activity was undertaken by the undergraduate students of São Lucas Dental School during the biennial action, which offers the population free services and guidance directed to the local reality. The community, individually addressed, was invited to answer questions read by students and answers were selected through images and pinned on the game board. This strategy aimed to avoid the embarrassment of individuals who are not literate or do not have sufficient command of the Portuguese language. In the end, each participant was oriented according to their hits and misses. The experience resulted in the participants' natural involvement and active learning, as once involved in the game, one becomes curious to know the correct answers. It is believed that by making the population feel part of the process, it is possible to obtain more positive results than those achieved with traditional guidance. The feedback from the community and students reinforced the view that through engagement strategies learning becomes more satisfying and enjoyable.

**Keywords:** Oral Health; Orientation; Experimental Game.

**STUDY CENTER AND CARE FOR SPECIAL PATIENTS: NEAPE*****Núcleo de estudo e atendimento a pacientes especiais: NEAPE***

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Dentistry for patients with special needs (NPS) is an area in which few dental surgeons venture. In addition

to the difficulties inherent in dentistry, the care of NPS is a differential, since there is difficulty to handle in the dental office due to many physical, mental and behavioral limitations. The project NEAPE (ICT-UNESP) aim to meet the demands of the community whose target public is NPS from 0 to 18 years old with the possibility of outpatient care. Classes about the treatment of these patients by teachers and postgraduates are taught. Besides that, debates, discussions are made, raise demands, realign directions, welcome suggestions and after planning put them in discussion with the team in search of better solutions. The project annually benefits 108

NPS, who need basic health and life care, which are attended by 60 students from 1<sup>nd</sup> to 6<sup>th</sup> period. Students benefit from their education as it is not offered in the current undergraduate study; in addition they learn how to team work. The focus beyond oral health is the pursuit of

patient conditioning so that the dental environment is not hostile and unpleasant, so the conclusion is that the project embraces dentistry as much as possible.

**Keywords:** Patient Education; Pediatric Dentistry; Handling.

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01

Basic Research - Graduate Students

**PROPOLIS EXTRACTS PRESENT ANTIBIOFILM ACTION ON MULTIRESTANT PSEUDOMONAS AERUGINOSA AND KLEBSIELLA PNEUMONIAE*****Extratos de própolis apresentam ação antibiofilme sobre Pseudomonas aeruginosa e Klebsiella pneumoniae multirresistentes***

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The aim of this study was to evaluate the antimicrobial and antibiofilm action of glycolic (GE) and aqueous (AE) extracts of commercially distributed propolis on ATCC and multiresistant strains of *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*, bacteria that especially affect immunocompromised individuals. For this, Minimum Microbicide Concentration (MMC) values were determined in planktonic culture by broth microdilution followed by agar sowing. The concentration corresponding to MMC x 8 was tested in monotypic biofilms (5 min-contact), applying chlorhexidine solution (0.12%) and culture medium as controls, to verify the viability of microbial biofilms by the MTT test, in which the optical density data obtained were converted to a percentage reduction in microbial viability. Statistical analysis was performed with 5% significance. There was microbicidal action for both species: The GE MMC values for *P. aeruginosa* were 3.12 and 6.25 mg / mL and AE MMC values were 6.87 and 27.5 mg / mL (absent for three strains); for *K. pneumoniae*, the GE MMC were 3.12 to 12.5 mg / mL and 27.5 mg / mL of AE (absent for three strains). Viability reductions in *P. aeruginosa* biofilms reached 54.42% (GE) and 64.66% (AE) and in *K. pneumoniae* 64.24% (GE) and 65.13% (AE). It can be concluded that propolis extracts have antibacterial and antibiofilm action on antibiotic-multiresistant *P. aeruginosa* and *K. pneumoniae* strains, which could be considered potential therapeutic agents to combat the pathogens.

**Keywords:** *Pseudomonas aeruginosa*; *Klebsiella pneumoniae*; Biofilms; Drug Resistance.

02

Basic Research - Graduate Students

**IN VITRO EVALUATION OF THE ANTIMICROBIAL EFFECT OF N-ACETYLCYSTEINE AND PHOTODYNAMIC THERAPY ON ROOT CANALS INFECTED WITH ENTEROCOCCUS FAECALIS*****Avaliação in vitro da ação antimicrobiana da n-acetilcisteína e terapia fotodinâmica sobre canais infectados com enterococcus faecalis***

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The aim of this study was to evaluate the efficacy of N-acetylcysteine (NAC) and NAC with photodynamic therapy (PDT) in the disinfection of *Enterococcus faecalis* (*E. faecalis*) infected root canals. Ninety human teeth were divided into 5 groups (n=16) according to the treatment used: Saline Solution (control); Ca(OH)<sub>2</sub>; NAC; PDT; NAC + PDT. Ten samples from each group were prepared for microbiological culture analysis (CFU/mL) after contamination with *E.*

*faecalis* for 21 days. The other 8 samples from each group were prepared for Scanning Electron Microscopy (SEM) and Confocal Laser Scanning Microscopy (CLSM) and subjected to a 5-day contamination protocol. For the analysis of CFU/mL, after tooth contamination, three samples were removed from the root canals: after 21 days of contamination, immediately after instrumentation and 14 days after the treatment. The presence of *E. faecalis* in the root canal walls and inside the dentinal tubules was evaluated by SEM and CLSM, respectively. Kruskal-Wallis, followed by Dunn test, was used to analyze the statistically obtained data. CFU/mL analysis showed that Ca(OH)<sub>2</sub>, NAC and NAC+PDT promoted higher antibacterial activity than the other groups. SEM showed significant disinfection of *E. faecalis* in the NAC and NAC+PDT groups. The CLSM indicated that all groups were effective in eliminating *E. faecalis*, except the saline solution group. Thus, NAC was bactericidal against *E. faecalis* biofilms, with/without PDT, presenting antimicrobial activity similar to that of Ca(OH)<sub>2</sub>.

**Keywords:** N-Acetylcysteine; Photodynamic therapy; Scanning Electron Microscopy; Confocal Laser Scanning Microscopy.

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03

Basic Research - Graduate Students

## GLUT-1 APPLICABILITY IN THE DIFFERENTIATION OF ORAL PERIPHERAL NERVE SHEATH TUMORS

### *Aplicabilidade do glut-1 na distinção de tumores da bainha do nervo periférico*

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The glucose transporter type 1 (GLUT-1) is a transmembrane protein that supports glucose uptake. It is usually expressed in many human body cells and it has also been observed in tumor cells. The aim of this study was to compare GLUT-1 immunoexpression in 47 oral peripheral nerve sheath tumors. The cases were obtained from Pathology archives of ICT/UNESP. The evaluated samples totalized 21 cases of neurofibroma (NF), 12 cases of traumatic neuroma (TN), 5 cases of neurilemmoma (NL), 5 cases of solitary circumscribed neuroma (SCN) and 4 cases of pseudoperineurioma (P), which were submitted to immunohistochemical analysis with GLUT-1 antibody. The criteria used for the analysis were the percentage (<25% - 1, 26 to 50% - 2, 51 to 75% - 3, and > 75% - 4) and the intensity of cells staining (weak - 1, moderate - 2, strong - 3), thus after this evaluation, a score (quickscore) was obtained from the multiplication of the percentage values by the intensity ones. Lesions were then separated into two categories, quickscore between 1-5 or 6-12, and the data submitted to statistical analysis by Fisher's exact test ( $p < 0.05$ ). All categories of lesions were positive for GLUT-1. However, it was observed that SCN presented lower score than NF, TN and P ( $p = 0.01$ ;  $0.002$ ; and  $0.04$ ; respectively), once it was observed weak staining in almost all cases of SCN. We concluded that GLUT-1 may be a useful immunomarker to help in the differentiation of SCN and other neural lesions in cases where the diagnostic may be difficult.

**Keywords:** Glut-1; Oral peripheral nerve sheath tumors; Neural tumors.

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**USE OF HYALURONIC ACID ASSOCIATED TO THE PLATELET-RICH PLASMA IN THE REGENERATION OF JOINT DISC AND OSTEOCHONDRAL SURFACE DEFECTS*****Uso de ácido hialurônico associado ao plasma rico em plaquetas na regeneração de defeitos do disco articular e da superfície osteocondral***

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Previous studies have reported that hyaluronic acid (HA) and platelet-rich plasma (PRP) have the potential to improve the cartilage healing process and slow the progression of osteoarthritis. However, few studies have evaluated its synergistic effect. The objective of this study was to evaluate the effect of PRP-associated HA on the regeneration of the articular disc and osteochondral surface of the temporomandibular joint (TMJ). Osteoarthritis was induced by bilateral articular disc perforation in 24 rabbits, which were further divided into 2 groups (n = 12): no treatment (ST) and treatment with AH + PRP. After 8 and 24 weeks of disc perforation, six rabbits were euthanized. Macroscopic, histological and histochemical analyzes were performed in the articular disc and on the osteochondral surface of the TMJ. Macroscopically, the articular disc generally presented partial or total filling of the created defect. Histological analysis confirmed areas of calcification and fibrosis. The condyles generally presented irregularity of the osteochondral surface, which were seen macroscopically. In the histochemical analysis, the percentage of collagen I prevailed in the disc and condyle, regardless of the group and period evaluated. In the condyle, AH + PRP presented a significantly higher percentage of collagen I than ST (p <0.05). In conclusion, the treatment of osteoarthritis with HA associated with PRP showed promising results, but without satisfactory results as protectors of the osteochondral surface in the presence of disc perforation.

**Keywords:** Temporomandibular Disorders; Platelet-Rich Plasma; Hyaluronic Acid; Osteoarthritis.

**COMBINED ACTION OF ROSEMARY EXTRACTS (*ROSMARINUS OFFICINALIS* L.) AND POMEGRANATE (*PUNICA GRANATUM* L.) AGAINST *CANDIDA ALBICANS******Ação combinada dos extratos de alecrim (*rosmarinus officinalis* l.) E romã (*punica granatum* l.) Sobre *candida albicans****

Meccatti VM, Figueiredo-Godoi LMA, Pereira TC, Santos PBRE, Ramos LP, Liberato SFS, Oliveira LD.  
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The aim of the study was to evaluate the antifungal potential of combined rosemary and pomegranate glycolic extracts. The technique "checkerboard" was used which is based on broth microdilution test of the Clinical and Laboratory Standards Institute. The medium used was RPMI 1640 and the fungal suspension was standardized in saline solution (1x10<sup>6</sup> cells/mL).

The minimum inhibitory concentration (MIC) isolated from the extracts was previously evaluated to guide the concentrations that would start the experiment. In a 96-well plate, the extremity columns were used as controls (negative and positive). From row A to row G (columns 2 to 9), the wells received 50 µL of medium and only in row A was added 50 µL of pomegranate extract. Thereafter, serial dilutions were performed, and row B received 50 µL of the contents of wells from row A and so on to row G. Then all wells received 50 µL of the seriously diluted rosemary extract in microtubes (each column received a concentration corresponding to one microtube). Finally, 100 µL of inoculum was added, totaling 200 µL/well. The plate was incubated at 37°C/48 h for later visual reading. The fractional inhibitory concentration index (FIC) was adopted to verify the possible synergistic action. The extracts showed additive combination in 4 wells that had no turbidity and the FIC was  $> 0.5$  and  $\leq 1.0$ . It can be concluded that the glycolic extracts of rosemary and pomegranate act additively against *C. albicans*.

**Keywords:** Drug synergism; *Rosmarinus officinalis*; *Punica granatum*; *Candida albicans*.

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06

Basic Research - Graduate Students

#### ANTIMICROBIAN ACTION OF DIFFERENT GLYCOLIC EXTRACTS AND SYNERGISM OF PROPOLIS AND GINGER

##### *Ação antimicrobiana de diferentes extratos glicólicos e sinergismo do própolis e gengibre*

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Open wounds increase the risk of microbial contamination. Our objective was to evaluate the action of *Rosmarinus Officinalis* (Rosemary), *Pfaffia Paniculata* (Pfaffia), *Zingiber officinale Roscoe* (Ginger), *Hamamelis virginiana L.* (Hamamelis), *Juglans regia L.* (Nogueira) and *Propolis Wax* (Propolis) extracts in the planktonic form of ATCC strains of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, *Escherichia coli*, *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* as well as the Synergism of Propolis and Ginger with the same microorganisms (mo). Minimum Inhibitory Concentration (MIC) and Minimum Microbicidal Concentration (MMC) were determined with broth microdilution according to CLSI standards with subsequent agar sowing. For the Checkerboard, the same procedures were performed with combined Propolis and Ginger extracts. The extracts that presented the best results in MIC and MMC were Rosemary, Ginger, Hamamelis, and Propolis. In the Checkerboard there were additive results with *E.coli*, *S. pyogenes*, and additive and synergistic with *S. epidermidis*. The extracts of Rosemary, Ginger, Propolis, and Hamamelis, as well as Propolis combined with Ginger, showed a significant reduction in the planktonic form of the mo being indicated for biofilm studies.

**Keywords:** Herbal medicine; Wounds; Natto bacteria; Drug synergism.

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07

Basic Research - Graduate Students

**CORRELATION BETWEEN INFLAMMATORY CELLS AND HPV TYPE IN LARYNGEAL PAPILLOMATOSIS*****Correlação entre o tipo de hpv e as células inflamatórias na papilomatose laríngea***

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Laryngeal papillomatosis (LP) is an uncommon disease, caused by the human papillomavirus (HPV), types 6 and 11. It is divided into two groups: juvenile (JLP) and adult (ALP). Its course can be aggressive with relapses, risk of malignant transformation, pulmonary dissemination and air obstruction. The aim of this study was correlate LP clinical-pathological features with Derkay's laryngoscopic scale. There were collected samples of 36 patients with JLP and 56 patients with ALP. HPV genotyping was performed. In tissue microarray slides, Anti-Factor XIIIa, CD3, CD4, CD8, CD15, CD20, CD68, FoxP3 and MUM-1 immunohistochemical reactions were performed to characterize the inflammatory cells. Results were submitted to statistical analysis. The JLP group was considered more aggressive ( $P=0.02$ ). Regardless of age the HPV 11 was correlated with most aggressiveness cases ( $P=0.01$ ). The ALP samples showed higher quantities of CD3+ cells, CD8+ and MUM1+ ( $P<0.05$ ). The presence of CD15+ is directly proportional to the Derkay index ( $P<0.05$ ), while MUM-1 is inversely proportional ( $P=0.01$ ). Based on these results, it was concluded that LP aggressiveness is related to the age, to the HPV type and to the presence of inflammatory cells that also differed between the groups PLJ e PLA.

**Keywords:** Laryngeal papillomatosis; HPV; Inflammation; Immunohistochemistry.

08

Basic Research - Graduate Student

**INTERACTION OF *LACTOBACILLUS REUTERI* AND PERIODONTOGENIC BACTERIA USING *IN VITRO* AND *IN VIVO* (*G. MELLONELLA*) APPROACHES*****Interação entre lactobacillus reuteri e bactérias periodontopatogênicas utilizando abordagens in vitro e in vivo (g. Mellonella)***

Santos TA, Scorzoni L, Correia R, Santos AC, Junqueira JC, Anbinder AL  
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Periodontal disease is among the major oral disease that affects the worldwide population. New therapies have been proposed as adjunct to conventional treatment, including the use of beneficial bacteria. The objective of this study was to evaluate the *in vitro* antimicrobial effects of live *L. reuteri*, heat-killed one and your culture filtrate (supernatant), on periodontopathogenic bacteria (*Fusobacterium nucleatum* and *Aggregatibacter actinomycetemcomitans*), as well as, to evaluate the immunomodulatory effects of these preparations in *Galleria mellonella*. The antimicrobial activity was evaluated *in vitro* by associating the pathogenic bacteria to live, heat killed or *L. reuteri* supernatant. After interaction, the bacteria were cultured in a selective medium for colony-forming unit (CFU)

count. In the study with *G. mellonella*, after infection with pathogenic bacteria and *L. reuteri* preparations, the survival curve and hemocyte density were evaluated. *In vitro*, all preparations reduced growth of *F. nucleatum*, while only live *L. reuteri* reduced the growth of *A. actinomycetemcomitans*. *In vivo*, although all preparations reduced growth of periodontopathogens, when infected by *F. nucleatum*, the treatment with the supernatant increased the survival of larvae and none of the preparations was active against *A. actinomycetemcomitans*. Thus, it was concluded that the probiotic and the derived products presented antimicrobial effects and increased the survival of *G. mellonella* when infected by *F. nucleatum*.

**Keywords:** Periodontal diseases; Probiotics; *Fusobacterium nucleatum*; *Aggregatibacter actinomycetemcomitans*; *Lactobacillus reuteri*.

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09

Basic Research - Graduate Student

#### **INTERACTION OF *LACTOBACILLUS REUTERI* (LIVE, HEAT-KILLED AND SUPERNATANT) AND COMMENSAL BACTERIA *IN VITRO***

***Interação entre lactobacillus reuteri (vivo, inativado pelo calor e sobrenadante) e bactérias comensais in vitro***

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Probiotics have been studied for the prevention and treatment of oral diseases, and their presence in the oral ecosystem is important to long term effects. In addition, little is known about the effects of probiotics on non-pathogenic bacteria that are part oral ecosystem. The objective of this study was to evaluate the antimicrobial effects of live *L. reuteri*, heat-killed one and the culture filtrate (supernatant), on oral health-associated commensal bacteria, *Streptococcus mitis* and *Streptococcus salivarius*, as well as to evaluate the antimicrobial effects of both bacteria on *L. reuteri*. *In vitro*, the antimicrobial activity was evaluated by associating the pathogenic bacteria to live, heat-killed or *L. reuteri* supernatant. After interaction, the bacteria were cultured in a selective medium for colony-forming unit (CFU) count. *S. salivarius* significantly reduced the number of CFU of *L. reuteri*, while no interference with *S. mitis* was observed. The viable probiotic was the preparation with the greatest antimicrobial effect on commensal bacteria. Heat-killed *L. reuteri* and its supernatant did not influence the growth of *S. mitis* and *S. salivarius*. Thus, it was concluded that *S. salivarius* has antimicrobial effect on *L. reuteri*, as well as the probiotic on commensal bacteria. The results demonstrated the complexity of the oral ecosystem, and the understanding of the relationship between probiotics and other bacteria is important to evaluate doses and administration schedules that may favor probiotic colonization.

**Keywords:** *Streptococcus mitis*; *Streptococcus salivarius*; *Lactobacillus reuteri*; Probiotics.

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**IN VITRO EFFECTIVENESS OF Nd: YAG LASER AND FLUORINE COMBINATION IN THE ANTI-CARIE EFFECT*****Eficácia da combinação do laser nd:yag e flúor no efeito anti-cárie in vitro***

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To evaluate the acid resistance of Nd: YAG laser irradiated enamel associated with topical application of 12.300  $\mu\text{g F}^- / \text{g}$  Acidulated Fluoride Phosphate (AFP) submitted to the critical pH for fluorapatite (FA). Twenty enamel blocks homogenized by Surface Microhardness were divided into 4 groups (n=5): untreated, FFA, Nd: YAG laser and FFA + Nd: YAG laser (84 mJ /  $\text{cm}^2$ , for 30 seconds in motion with previous application of charcoal as photoabsorbent). Scanning Electron Microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR) were performed before and after pH cycling. In the FTIR, the spectrum was collected in the range 400-4000 $\text{cm}^{-1}$  with 4 $\text{cm}^{-1}$  spectral resolution, all spectra were stored and an average of the spectrum was obtained. SEM showed that the enamel structure of the treatment group remained integrated; and in FTIR it was possible to observe higher absorbance peak in the wavelength corresponding to the phosphate band. Conclusion: The FFA + Nd: YAG group, differently from the other groups, remained resistant indicating the possibility of the irradiated FA to present a different critical pH, which would alter the current prevention pattern.

**Keywords:** Dental caries; Tooth Demineralization; Dental enamel; pH; Nd-YAG lasers.

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01

Basic Research - Undergraduate Students

**BIOFILM REMOVAL OF *CANDIDA ALBICANS* AND *STREPTOCOCCUS MUTANS* IN CLEAR ALIGNERS**

***Remoção de biofilme de Candida albicans e Streptococcus mutans de alinhadores invisíveis***

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The use of clear aligners in orthodontic treatments may increase and modify the resident oral microflora, being necessary to implement a cleaning method preventing the risk of opportunistic infections. This study aimed at analyzing the effectiveness of sanitizing substances on the removal of *C. albicans* and *S. mutans* biofilms in clear aligners. Samples were made out of novel clear aligners, and sterilized through both their submersion in alcohol 70% and exposure to ultraviolet radiation. Biofilms were grown through bacterial standardized suspensions of *C. albicans* and *S. mutans* on samples. Right after their incubation, the cleaning protocols were performed as follows: Saline solution (10 min), 0.5% (20 min) and 1% (10 min) sodium hypochlorite solution, chlorhexidine (5 min), Corega Tabs (15 min) and Ortoform Gel (15 sec). Next, for the CFU/mL (colony-forming units per milliliter) determination, serial dilutions were performed and aliquots plated in Petri dishes with specific selective culture media for each microorganism. Data obtained by ANOVA and Tukey tests showed that all treatments presented biofilm reduction. However, chlorhexidine was the agent with the highest effectiveness in *C. Albicans* biofilm. All groups showed a complete reduction in *S. mutans* biofilm. The obtained data contribute to the control of opportunistic infections by promoting a consensus in the use of different cleaning agents, showing numerically the effectiveness of different cleaning protocols, including the most commonly used and recently developed solutions in Dentistry.

**Keywords:** Biofilms; *Candida albicans*; Orthodontic appliances; *Streptococcus mutans*.

02

Basic Research - Undergraduate Students

**INFLUENCE OF IIIIP OXYGEN TREATMENT ON OSTEOBLASTIC ACTIVITY AND BIOFILM FORMATION: IN VITRO STUDY ON IT SAMPLES**

***INFLUÊNCIA DO TRATAMENTO IIIIP COM OXIGÊNIO SOBRE A ATIVIDADE OSTEOBLÁSTICA E A FORMAÇÃO DE BIOFILME: ESTUDO IN VITRO EM AMOSTRAS DE TI***

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The aim of this study was to correlate the osteogenesis and the *in vitro* biofilm formation on Titanium (Ti) surfaces submitted to ion implantation treatment by immersion in oxygen plasma (IIIIP-O). Samples were treated with IIIIP-O at different temperatures to obtain modifications on the Ti oxide layer. Following this, samples were analyzed through Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectroscopy Analysis (EDXA). During the osteogenesis stage, cell viability, alkaline phosphatase, cell adhesion and formation of

mineralization nodules were evaluated after the culture of MG-63 cells (human osteoblasts) on samples. Standardized suspensions with *S. aureus*, *S. mutans*, *P. aeruginosa* and *C. albicans* were seeded on the surface of each sample, and then submitted to the MTT test for the analysis of monotypic biofilm formation. In the results, SEM images showed similar surface topographies after the implementation of different treatment temperatures. However, EDXA showed that samples treated at 600 °C were the ones with better results, due to the greater incorporation of oxygen and the prevalence of the rutile phase. The results showed greater cell viability on Ti surfaces. A statistically significant difference ( $p < 0.05$ ) was observed between the treated samples and the control group (Ti without treatment). The conclusion was that the 600 °C temperature showed better results in both cell culture and antimicrobial assays.

**Keywords:** Biofilms; energy dispersive x-ray spectroscopy; Scanning electron microscopy; Titanium.

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03

Basic Research - Undergraduate Students

**ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY OF *ARCTIUM LAPPA* GLYCOLIC EXTRACT ON MULTIRESTANT CLINICAL STRAINS OF *PSEUDOMONAS AERUGINOSA***

***Ação antimicrobiana e antibiofilme de arctium lappa sobre cepas clínicas de pseudomonas aeruginosa multiresistentes.***

Oliveira TCFR, Santos PBRE, Pereira TC, Paula-Ramos L, Liberato SFS, Meccatti VM, Oliveira LD.  
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The aim of this study was to evaluate the antimicrobial and the antibiofilm activity of Burdock (*Arctium lappa*) glycolic extract as an antibacterial phytotherapeutic medicine in a standard strain (ATCC strain) and in three multidrug-resistant strains of *Pseudomonas aeruginosa* - an opportunistic bacterium which causes acute and chronic infections in the oral cavity. Tests were performed to determine the Minimum Inhibitory Concentration (MIC) and the Minimum Microbicidal Concentration (MMC) using the broth microdilution method and sowing, respectively, for each strain in order to evaluate the action of the *arctium lappa* glycolic extract against the planktonic form of *P. aeruginosa*. To verify the action on the biofilm, the microorganism cell viability test (MTT) was performed after a 5-minute and 24-hour treatments with the extract. Statistical analysis was performed using ANOVA and Tukey or Kruskal-Wallis method and Dunn's test (5% significance). The MIC was 50 mg/mL for all strains, but none of them was identified through MMC. With the 5-minute treatment, the viability of the standard strain biofilm was reduced by up to 1.25% and there was no reduction in the viability for one of the multidrug-resistant strains, although reductions for the other strains ranged from 12.51% to 26.41 %. After the 24-hour treatment, the viability of the biofilms of the multidrug-resistant strains decreased from 33.65% to 91.16%, and the ATCC strain decreased from 39.30% to 51.42%. The conclusion is that Burdock glycolic extract can be considered effective in the antibiofilm action against multidrug-resistant *P. aeruginosa* strains, especially with the 24-hour treatment.

**Keywords:** *Arctium lappa*; Herbal medicine; *Pseudomonas aeruginosa*.

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**ANTIMICROBIAL ACTION OF AVOCADO AND GINGER EXTRACTS ON STANDARD AND MULTIDRUG-RESISTANT *KLEBSIELLA PNEUMONIAE* STRAINS**

***AÇÃO ANTIMICROBIANA DE EXTRATOS DE ABACATEIRO E GENGIBRE SOBRE CEPAS PADRÃO E MULTIRRESISTENTES DE *Klebsiella pneumoniae****

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The aim of this study was to evaluate the antimicrobial activity of avocado and ginger glycolic extracts on standard and multidrug-resistant *Klebsiella pneumoniae* strains in planktonic forms to identify Minimum Inhibitory Concentration (MIC) and Minimum Microbicide Concentration (MMC). For the methodology, the ATCC 4352 strain and 3 multidrug-resistant strains (152841, 1533520 and 714810) of *K. pneumoniae* were used. Initially, MIC was determined by broth microdilution according to CLSI standards (M07-A9, 2012) in order to verify the inhibitory action of extracts in which the lowest concentration well that showed no turbidity for each microorganism was identified after 24 h contact. Then, the seeding was done in solid culture medium to determine the MMC after being incubated for 48 h. The avocado extract showed MIC of 6.25 mg / mL for ATCC 4352 and 152841 strains and of 12.5 mg / mL for strains 714810 and 1533520. Regarding the microbicidal action, the avocado extract presented MMC equal to 6.25 mg / mL for strains ATCC 4352 and 152841 and equal to 12.5 mg / mL for strains 714810 and 1533520, while the ginger extract showed values of MIC and MMC equal to 3.12 mg / mL for all strains. It was concluded that avocado and ginger extracts have antimicrobial activity on standard and multidrug-resistant strains of *K. pneumoniae* demonstrating potential for clinical combat of the species.

**Keywords:** Persea; Ginger; Anti-Bacterial Agents; *Klebsiella pneumoniae*.

**EFFECT OF PULSED ELECTROMAGNETIC FIELDS ON IMPLANTS OSSEOINTEGRATION IN RATS TIBIA: ASSAYS WITH OSTEOBLASTS**

***Efeito do campo eletromagnético pulsado na osseointegração de implantes inseridos em tíbias de ratos: ensaios em osteoblastos***

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The aim of this study was to evaluate the effect of different application times of the pulsed electromagnetic field (PEMF) on tibias to establish the best effect on osseointegration. Sixty rats (*Rattus norvegicus*, *albinus*, Wistar) were randomized into three groups: control, test A and test B. All animals received implants in the right tibia, with PEMF application only in the test groups. The femurs were separated and prepared for in vitro biological assays of cell proliferation, cell viability, total protein content, alkaline phosphatase activity and mineralization nodules. Data were submitted to ANOVA test to evaluate the effect of treatment levels on euthanasia periods. The results revealed that group B showed better

results compared to group A in cell proliferation at 21 days, cell viability at 7 and 45 days, total protein content at 7 days and mineralization nodules at 3 and 7 days. Group A showed better cell proliferation performance at 3 and 45 days compared to group B. Test groups showed better results than cell viability control, total protein content and alkaline phosphatase. The application of PEMF was effective in optimizing the cellular events in bone tissue that promote osseointegration, especially when applied in shorter time and in the initial periods of bone healing.

**Keywords:** Osseointegration; Electromagnetic fields; Primary cell culture; Osteoblasts.

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06

Basic Research - Undergraduate Students

**EFFECTS OF ELECTRICAL STIMULATION ON THE REPAIR OF PERIODONTAL BONE DEFECTS IN RATS. HISTOMORPHOMETRIC ANALYSIS**

***Efeitos da estimulação elétrica no reparo de defeitos ósseos periodontais em ratas. Análise histomorfométrica***

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Periodontitis (P) is a chronic inflammatory disease resulting from a complex polymicrobial infection, leading to destruction of periodontal tissues. Osteoporosis is a chronic and multifactorial disease that result from a skeletal disorder that promotes bone fragility by reducing its mass. Several experimental studies have demonstrated that Pulsed Electromagnetic Field (PEMF) stimulation can promote osteogenesis, potentially increase bone mineralization and reduce acute and chronic inflammation. This study evaluated by means of histomorphometry the influence of PEMF on periodontal disease in rats with and without estrogen deficiency. Sixty adult female rats were randomized into two experimental groups, Sham (n = 30) and ovariectomized (OVZ;n = 30). After P induction, groups received PEMF therapy or not. After sacrifice, histomorphometric analysis of bone loss (BL) in the furcation area, periodontal attachment loss (PAL) and interproximal bone loss (IBL) between the 1st and 2nd lower molars was performed. For the histomorphometric analysis we used the computer program R (R Core Team, 2017). The statistics for furcation area were performed by one-way ANOVA followed by Tukey, at a significance level of 95%. The PAL and IBL data were submitted to the Kruskal-Wallis test to evaluate the treatment effect in the groups. The histomorphometry of the furcation BL showed no statistically significant difference between the subgroups, the same occurred with PAL and IBL. However, there is an upward trend of loss in IBL and IBL in the OVZ-O subgroup. Beneficial performance of PEMF therapy was observed in OVZ P-animals (OVZ-CEMP).

**Keywords:** Periodontal diseases; Eletromagnetic fields; Estrogen deficiency; Ovariectomy.

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07

Basic Research - Undergraduate Students

**EVALUATION OF THE INFLUENCE OF BONE CEMENT BASED ON CALCIUM SILICATE, MODIFIED WITH NH<sub>4</sub><sup>+</sup> ON OSTEOGENIC DIFFERENTIATION: *IN VITRO* STUDY**

***Avaliação da influência do cimento ósseo a base de silicato de cálcio, modificado com NH<sub>4</sub><sup>+</sup>, na diferenciação osteogênica: estudo in vitro***

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Several materials are used to assist in bone repair, and calcium silicate cement (CaSiO<sub>3</sub>) emerge as an alternative, since it manages to combine the ability of TCP to form cement with the bioactivity of the bioglass. The objective of this project was to evaluate the impact of activating solutions for CaSiO<sub>3</sub> formation on osteogenic differentiation. Calcium silicon samples were produced with a different activating solution, composed of a buffer solution (pH≈7) associated with phosphate and NH<sub>4</sub><sup>+</sup>, promoting mechanical and biological changes in the final cement composition. Mesenchymal cells obtained from mouse femurs were analyzed in vitro, evaluating the influence of activity rates and osteoblastic differentiation. The results of the in vitro analyzes were grouped in an NH<sub>4</sub><sup>+</sup> group cultivated with supplemented medium and another with osteogenic medium. Cell viability data identified as the materials were not cytotoxic, and the group cultivated in osteogenic medium showed the highest value with statistical difference from the others (p <0.05). ALP values did not differ between groups (p > 0.05). Total protein expression was lower in the non-osteogenic group than in the others (p > 0.05). The results demonstrated that the NH<sub>4</sub><sup>+</sup> group promote positive influence on the activity and cell differentiation independent of the culture medium. Emphasizing that the sample of NH<sub>4</sub><sup>+</sup> induces differentiation due to its higher production of ALP in non-osteogenic medium.

**Keywords:** Biocompatible materials; Bioceramic; Mesenchymal stem cells; Osteogenesis.

08

Basic Research - Undergraduate Students

**ANTIFUNGIC EFFECTS OF GLYCOLIC EXTRACTS OF BLACKBERRY, GRAPE, WHITE ROSES AND WALNUT AGAINST *C. ALBICANS***

***Efeitos antifúngicos dos extratos glicólicos de amora, uva, rosas brancas e noqueira frente a *c. albicans****

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*Candida albicans* is an opportunistic yeast that mainly affects immunocompromised individuals. Antifungals are used for the treatment of candidiasis, but the high toxicity with the development of resistance of them has become a major limitation. Therefore, herbal medicine has been investigated, since numerous plant extracts have antifungal effects. Thus, the aim of this study was to determine the Minimum Inhibitory Concentration (MIC) and the Minimum Fungicidal Concentration (MFC) of the glycolic extracts of Amora (*Morus nigra* L.), Grape (*Vitis vinifera* L.), White Roses (*Rosa alba* L.) and Nogueira (*Juglans regia*) against *Candida albicans* yeast (ATCC 18804). For this, the MIC was determined according to the broth microdilution method recommended by the Clinical and Laboratory Standards Institute (CLSI-M27-S4). The MFC was determined by plating on Sabouraud agar aliquots from the microdilution assay dilutions. All assays were performed in duplicate. MIC values were 12.5 mg / mL for Grape, 25 mg / mL for Blackberry, 50 mg / mL for White Roses and Walnut. All MIC and MFC values

coincided, so the extracts were considered fungicidal. Thus, the studied extracts represent an alternative to be explored in the therapy of fungal infections caused by *Candida albicans*.

**Keywords:** *Candida albicans*; Antifungal agents; Plant extracts; Phytotherapy.

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09

Basic Research - Undergraduate Students

**PORPHYROMONAS ENDODONTALIS BIOFILM IS CONTROLLED BY CYNARA SCOLYMUS (ARTICHOKE) EXTRACT**

***Biofilme de porphyromonas endodontalis é controlado por extrato de cynara scolymus (alcachofra)***

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The antimicrobial potential of artichoke extract was evaluated on *P. endodontalis* biofilms (ATCC 35406). The bacterium was grown on Brucella agar enriched with hemin and menadione and incubated in anaerobiosis (37°C / 48 h). Then, microbial suspensions were prepared in physiological solution and standardized on McFarland 0.5 scale. Aliquots of the suspension were added (100 µl / well) in 96-well microplates plus 100 µl of enriched Brucella broth. The plates were incubated (37°C / 7 days in anaerobic condition) changing the broth every 48 h. Next, the biofilm was exposed to different concentrations of the extract, previously selected in the broth microdilution test (MIC and MMC), at contact times of 5 min and 24 h. As controls, saline solution (5 min) and saline + Brucella broth (24h) (n = 10) were used. Afterwards, the biofilm was disaggregated by sonication (25% potency / 30s). Twenty µL of the suspension was seeded on Brucella agar and the plates incubated in anaerobiosis (37°C / 48 h) for subsequent CFU / mL determination. Results were analyzed by ANOVA and Tukey test (p ≤ 0.05). The average reduction percentage of biofilms treated for 5 min with different concentrations of the extract was 79%. Already for 24 h, the tested concentrations inhibited above 91% the number of CFU/mL, being statistically significant in relation to the control. Artichoke extract evaluated for 5 min and 24 h showed antibiofilm effect on *P. endodontalis*.

**Keywords :** Biofilms; *Porphyromonas endodontalis*; *Cynara scolymus*; Phytotherapy.

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Basic Research - Undergraduate Students

**IN VIVO ANTIFUNGAL ACTIVITY OF ROSMARINUS OFFICINALIS L. GLYCOLIC EXTRACT IN THE MODEL OF GALLERIA MELLONELLA**

***Atividade antifúngica do extrato glicólico de rosmarinus officinalis l. In vivo no modelo de galleria mellonella***

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The purpose of this study was to evaluate the antifungal activity of *Rosmarinus officinalis* L. glycolic extract (rosemary) in *Galleria mellonella* larvae infected with *Candida albicans* with

emphasis on prophylaxis. The extract was commercially purchased (Seiva Brasilis, SP) and the larvae were obtained from the ICT Unesp Invertebrate Laboratory, with a body weight of 250 to 300 mg. Initially, different concentrations of the extract were inoculated in the larvae to evaluate the toxicity, being  $n = 15$  larvae / group. After obtaining the non-toxic concentration, the antifungal action was evaluated. The larvae received a single, non-toxic dose of the extract in the last right proleg and, after 24 h, were infected with standardized suspension of *C. albicans* in the last left proleg. As control, a group of larvae received PBS and, after 24h, the suspension of the microorganism. The insects were kept at 37 ° C for 7 days for daily counting and execution of survival curve. For statistical analysis, the log-rank test (Mantel-Cox) was used with  $p \leq 0.05$ . Regarding toxicity, there was no statistically significant difference among the experimental groups. For prophylactic action analysis, the concentration of 25 mg/mL was used and there was an increase in larval survival compared to the control group. However, there was no statistically significant difference among the groups. It can be concluded that the plant extract had no toxic effect on the larvae and showed possible antifungal and immunomodulatory activity against *C. albicans* in *G. mellonella* larvae.

**Keywords:** Rosmarinus; *Candida albicans*; *Galleria mellonella*.

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Basic Research - Undergraduate Students

**HAMAMELIS VIRGINIANA EXTRACT SHOWS ANTIBIOFILME ACTION ON PORPHYROMONAS GINGIVALIS AND FUSOBACTERIUM NUCLEATUM**

***Extrato de hamamelis virginiana apresenta ação antibiofilme sobre porphyromonas gingivalis e fusobacterium nucleatum***

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The antibiofilm action of *Hamamelis virginiana* extract was evaluated on monomicrobial biofilms of *P. gingivalis* (ATCC 33277) and *F. nucleatum* (ATCC 25586). Bacteria were cultured on Brucella agar enriched with hemine and menadione and incubated in anaerobiosis (37°C / 48 h). Microbial suspensions were prepared, standardized (McFarland scale 0.5) and added (100 µL / well) into 96-well microplates with 100 µL enriched Brucella broth and incubated in anaerobiosis (37 ° C / 7 days) with broth replacement every 48 h. Afterwards, the biofilm was treated for 5 min or 24h with 3 different concentrations of the extract, previously selected in the microdilution tests (MIC and MMC). Saline (5 min) and saline + Brucella broth (24 h) were the control groups ( $n = 10$ ). Then, the biofilm was disaggregated by sonication (25% potency / 30s) and 20 µL of the suspension was seeded on Brucella agar. After 48 h, CFU / mL was determined. Results were analyzed by ANOVA and Tukey test ( $p \leq 0.05$ ). The 24 h treatment provided greater reduction of the *F. nucleatum* biofilm with average of reduction in concentrations of 99%. Regarding *P. gingivalis* biofilm, both contact times promoted reductions, and the concentration of 25 mg / mL for 24 h was already able to promote 95% reduction of the biofilm. It was concluded that *H. virginiana* extract is effective on *F. nucleatum* and *P. gingivalis* biofilms at different contact times.

**Keywords:** Biofilms; *Porphyromonas gingivalis*; *Fusobacterium nucleatum*; *Hamamelis virginiana*.

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**IN VIVO STUDY OF BONE REPAIR OF CRITICAL DEFECTS USING SCAFFOLDS OF PBAT INCORPORATED WITH CNT AND NHAP**

***Estudo in vivo de reparo ósseo de defeitos críticos utilizando scaffolds de pbat incorporados com cnt e nhap***

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Due to the several advantages, the use of polymers as polymer supports for tissue regeneration and replacement has increased in recent years. The main objective in this study was to evaluate bone repair in critical defects in rat tibiae after filling with PBAT (poly(butylene adipate-co-terephthalate)) polymer nanofibers incorporated with nanohydroxyapatite (nHa) or composite (PBAT / nHA + CNT (carbon nanotubes)). The electrocautery scaffolds were analyzed morphologically and structurally by scanning electron microscopy. In the right tibia, the clot was stabilized and in the left tibia the critical bone defect was filled with the pre-determined material. During the experiment, the animals that were euthanized in 6 weeks received fluorochromatic bone markers attached to apatite to observe the process of bone neoformation. After euthanasia, the fragments of the right and left tibia were submitted to histomorphometric analysis. In the analysis of the percentage of bone neoformation and daily bone apposition there was no statistical difference among the groups ( $p > 0.05$ ), but the PBAT / nHA + CNT group showed a trend in a greater amount of bone tissue formation. It was concluded that the new nanofiber formed by the composite PBAT / nHa + CNT is a promising material to be used in the regeneration of critical defect.

**Keywords:** Hydroxyapatites; Carbon nanotube; PBAT; Bone regeneration.

**DIFFERENT TYPES OF PHOTOSENSITIZERS ASSOCIATED TO CHITOSAN IN PHOTODYNAMIC THERAPY ON *STREPTOCOCCUS MUTANS***

***Diferentes fotossensibilizadores associados à quitosana na terapia fotodinâmica sobre streptococcus mutans***

Ward RAC, Souza CM, Garcia MT, Pedroso LLC, Gonçalves NMF, Namba AM, Santos ELS, Junqueira JC  
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The aim of this study was to investigate the association of chitosan with Photodithazine® (PDZ) and Methylene Blue (MB) photosensitizers in Photodynamic Therapy (PDT) on *S. mutans* planktonic cultures. Initially, a standard suspension of *S. mutans* UA159 ( $10^6$  cells/mL) was prepared in a spectrophotometer, which was added to 96 well plates. Cultures were treated according to experimental groups receiving PDZ, MB, Chitosan or PBS (untreated), followed by laser irradiation or maintenance in a dark place (control). The effects of the treatments were analyzed by counting CFU/mL of *S. mutans* on Brain Heart Infusion Agar (BHIA) incubated for 48h at 37 °C (5% CO<sub>2</sub>). In addition, to confirm the penetration of PS and chitosan in *S. mutans*

cells, an absorbance test was performed. PDZ or MB mediated PDTs reduced approximately 2 log (CFU/mL) of *S. mutans* compared to the untreated control group. When Chitosan was associated with PDT, the antimicrobial effects were greater, with a reducing approximately 2.5 log (CFU/mL) for MB PDT and 4.5 log (CFU / mL) for PDZ PDT compared to the control group. In absorption tests, it was observed that chitosan increased the penetration capacity of PDZ in the *S. mutans* cell but did not interfere with the penetration of MB. The potentiating action of chitosan was higher on PDZ PDT compared to MB PDT.

**Keywords:** Photodynamic therapy; Chitosan; *Streptococcus mutans*.

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Basic Research - Undergraduate Students

### **IN VIVO ASSESSMENT OF BONE REPAIR USING BIOMATERIALS**

#### ***Avaliação in vivo do reparo ósseo com uso de biomateriais***

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Bone remodeling allows areas to be renewed and those that have suffered injuries such as micro fractures to be replaced with new tissues. However, when referring to very extensive lesions, regeneration does not occur spontaneously. Due to the limited amount of autogenous bone and the risks associated with the use of allogeneic and xenogeneic bone, new natural and synthetic biomaterials have been developed in recent decades with the aim of replacing bone tissue. The objective of this work was to evaluate the influence of bio-glass embedded PCL polymeric scaffolds exhibiting micro or nanoparticles on the resistance of newly formed bone tissue in critical defects in rat tibias. Bio-glass embedded PCL scaffolds exhibiting micro or nano particles were produced by the electrophilic technique. After making the nanofibers were characterized by scanning electron microscopy. Subsequently, the scaffolds were inserted into 24 adult rats. After making the critical bone defects in the tibias, both were filled with the predetermined material: a) PCL; b) PCL with micrometer particle bioglass; c) PCL with bioglass in nanometer particles. In addition to these 03 groups, the control group was also evaluated, in which defects were filled only with the clot. After 4 weeks, the animals were euthanized and the specimens underwent the three-point flexion test. We conclude that PCL scaffolds incorporated with bioglass nanoparticles positively influence bone neoformation.

**Keywords:** Electric wiring; Nanotechnology; Flexural strength; Bone regeneration.

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Basic Research - Undergraduate Students

### **EVALUATION OF ALUMINATE CEMENT-BASED BLENDES CALCIUM AS A BONE SUBSTITUTE: IN VITRO STUDY**

#### ***Avaliação de blendas à base de cimento de aluminato de cálcio como substituto ósseo: estudo in vivo***

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Calcium aluminate as a biomaterial has been evaluated for its physical, mechanical and biocompatibility properties. Studies report its application in bone repair due to the composition and coefficient of thermal expansion similar to that of human bone. The objective was to evaluate experimental compositions of calcium aluminate cement-based blends as bone substitutes aiming at bone repair. 40 rats were submitted to a critical bone defect in each femur, divided into 4 groups with  $n = 5$ , according to the defect filling: a) group C: calcium aluminate cement (CaCh); b) group P: polymethyl methacrylate cement (PMMA); c) group H: CaCh associated with hydroxyapatite; d) group Q: CaCh associated with chitosan. After 4 weeks the animals were euthanized. In right femurs, the histological and histomorphometric analysis was performed at the bone-sample interface. In the left femurs, the flexion test was performed to evaluate the fixation force between bone-sample. The statistical test used was ANOVA supplemented by Tukey. Histomorphometry showed no statistical difference between PMMA and each group; however, there is a tendency towards higher values of bone neoformation in the CaCh groups and the CaCh blend with hydroxyapatite. In the in vivo flexion test, the chitosan-filled group showed higher maximum strength and higher value in the rupture modulus, with a statistical difference from the PMMA control group. It is concluded that CaCh blends can be considered promising for bone repair application since they presented good results in the tests.

**Keywords:** Bone cement; Bone regeneration; Bone substitute.

#### **IN VIVO STUDY OF A BIOACTIVE SCAFFOLD WITH FUNCTIONAL GRADUATION FOR BONE REGENERATION**

***Estudo in vivo de scaffold bioativo com graduação funcional visando regeneração óssea.***

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This work aimed to evaluate the influence of the Bicolayer polymeric scaffold on bone neoformation, as well as on the mechanical property of bone repair in rat tibias. The Bicolayer polymeric scaffold was produced by the electrospinning technique, consisting of a PCL layer incorporated with bioglass particles, in micro and nanometric scale, and the other of PCL and chitosan. Twelve male adult rats were used in this study. Perforations of 3 mm in diameter were performed in the right and left tibias of all animals using seriate drills and abundant irrigation. The animals received in the bone defect of the left tibia the bioactive scaffold bicolayer, while in the right tibia occurred the filling with the clot. After 02 and 06 weeks of surgery, the animals were euthanized, being  $n = 6$  for each euthanasia period. A radiographic analysis of the tibias was performed to evaluate bone neoformation and subsequently, they were submitted to the three-point flexion test, using the flexural strength (load/N) parameter, to verify the influence of Biomaterial in the mechanical property of neoformed bone tissue. The data were subjected to statistical analysis of the Student's T-test. The results of both radiographic analysis and mechanical tests showed no statistical difference ( $p. 0.05$ ) between the groups, regardless of the evaluated period. It was concluded, therefore, that the Bicolayer polymeric scaffold did not promote bone neoformation and did not increase the mechanical property in the area of bone repair.

**Keywords:** Chitosan; Bioglass; Bone regeneration.

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Basic Research - Undergraduate Students

**ASSOCIATION OF FARNESOL TO ANTIMICROBIAL PHOTODYNAMIC THERAPY FOR CONTROL OF ENTEROCOCCUS FAECALIS**

***Associação do farnesol à terapia fotodinâmica antimicrobiana para controle de enterococcus faecalis***

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The aim was to evaluate the farnesol as a possible potentiator of photodynamic therapy (PDT) for the control of *Enterococcus faecalis*. Strains of *E. faecalis*, including one standard (ATCC 4083) and two clinical (strains 1 and 3) isolated from root canals were used. The effects of farnesol associated with PDT on planctonic cultures of *E. faecalis* on 96 wells plates were evaluated. To this end, farnesol (0.25 mM) was placed in contact with *E. faecalis* for 2 hours. Then, the PDT mediated by the blue methylene and laser photosensitizing (660 nm) was performed. The effects of PDT on *E. faecalis* were then evaluated by the counting of colony-forming units (CFU/mL). In addition, the ability of farnesol to interfere with the penetration of the photosensitizing in *E. faecalis* cells was evaluated by means of the sodium dodecyl sulfate absorption test (SDS). Data were analyzed by ANOVA ( $p < 0,05$ ). In the study of PDT on the planctonic cultures of *E. faecalis*, it was observed that when farnesol was associated there was a higher microbial reduction in relation to the control of PDT without farnesol. The standard strain presented a 4-log reduction in the CFU/mL count, while the clinical strains reached a 100% reduction. In the SDS absorption test, it was found that farnesol was not able to increase the penetration of the photosensitizing in the cell of *E. faecalis*. Therefore, it was concluded that farnesol was able to potentiate the photodynamic therapy against *E. faecalis*, but these effects were not correlated with the absorption of the photosensitizing in the microbial cells.

**Keywords:** *Enterococcus faecalis*; Photochemotherapy; Biofilms; Methylene blue; Farnesol.

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Basic Research - Undergraduate Students

**REGENERATION OF TMJ JOINT DISK DEFECTS TREATED WITH HA HYDROGEL ASSOCIATED WITH MSC-BM, WITH CONDROGENIC DIFFERENTIATION**

***Regeneração de defeitos no disco articular da atm, tratados com hidrogel de ah associado a ctm-mo, com diferenciação condrogênica***

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Joint injuries are associated with progressive degeneration of the cartilage, which has a low regenerative capacity. The Mesenchymal stem cells (MSCs) are been used to promote the repair of tissues, such as the cartilage. MSCs can be obtained from the bone marrow (BM) and differentiated into chondrocytes for the use in areas of joint degeneration. To evaluate the

effect of hyaluronic acid (HA) hydrogel with MSCs, derived from tibial BM, with chondrogenic differentiation on TMJ joint disc regeneration. MSCs were obtained from the tibial BM of 2 rabbits (approved by CEUA / ICT-CSJC-UNESP, under protocol No. 09/2015). The spinal cord concentrate (2 mL) was mixed with 2 mL of PBS and centrifuged for 5 min at 1500 rpm. The supernatant was discarded and the pellet was homogenized into 10 mL of supplemented alfa medium. The chondrogenic differentiation was induced by the chondrogenic medium after three weeks. The cells began to adhere after 72h of culture, acquiring a rounded and centrally-shaped shape. After 15 days of culture fibroblastic-looking, cell sheets are formed. The immunocytochemistry performed on differentiated BM-MSCs pellets evidenced the predominant presence of type II collagen. The results showed that the cells responded positively to the differentiation in chondrocytes, considering the evidence of type II collagen, characteristic of cartilaginous tissue, which suggests a potential cartilage regeneration.

**Keywords:** Mesenchymal stem cells; Guided tissue regeneration.

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Basic Research - Undergraduate Students

#### **HISTOLOGICAL AND HISTOMORPHOMETRIC EVALUATION OF SCAFFOLDS OF PBAT INCORPORATED WITH CNT AND NHAP IN BONE REPAIR OF CRITICAL DEFECTS**

##### ***Avaliação histológica e histomorfométrica de scaffolds de pbat incorporados com cnt e nhap no reparo ósseo de defeitos críticos***

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There are an increase in the use of polymers as polyester supports for regeneration and tissue replacement. In bone tissue engineering, the scaffold is one of the essential components for bone regeneration because it provides structural support for newly formed tissue. In this study, poly (butylene adipate-co-terephthalate) (PBAT) nanofibers associated with nanohydroxyapatite (nHap) or nHap with carbon nanotube (CNT) were developed and produced to verify their influence on the bone repair of critical defects. The scaffolds produced by electrospinning were analyzed morphologically and structurally by scanning electron microscopy. Fifteen male rats were used, in which critical defects were made in both tibias. In the left tibia, the bone defect was filled with the pre-determined material, and in the right tibia, the stabilization of the clot was expected. After 2 weeks, the animals were euthanized and the specimens were evaluated. In descriptive histological analysis, aspects of the development of bone repair were observed. Image J software was used for quantitative analysis of the bone repair tissue. Histomorphometrically, the composite group was the one that exhibited the greatest bone neoformation but demonstrated no significant differences among the groups ( $p > 0.05$ ). It was concluded that it was possible to prove the effectiveness of the composite and that the new nanofiber formed by PBAT / nHap + CNT is a promising material to be used in the regeneration of critical defects.

**Keywords:** Hydroxyapatites; Nanotubes; Carbon; Bone regeneration.

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**INFLUENCE OF A NEW BIOCERAMIC, INCORPORATED WITH DIFFERENT ANIONS, ON OSTEOBLASTIC ACTIVITY**

***Influência de uma nova biocerâmica, incorporada com diferentes ânions, na atividade osteoblástica***

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Calcium silicate cement (CaSiO) in the alpha wollastonite phase shows promising properties for bone repair acceleration and tissue regeneration (Shao et al. 2018), and combines bioactive characteristics of hydroxyapatite and bioglass (Pan et al. 2016), the incorporation of different anions such as ammonium (NH<sub>4</sub><sup>+</sup>), sodium (Na<sup>+</sup>) and potassium (K<sup>+</sup>) which in this work were evaluated for their biological interaction by *in vitro* assays of mesenchymal cells obtained from femurs of 9 rats (09/2015CEUA/ICT-CSJC-UNESP), were plated at a density of 1x10<sup>4</sup> viable cells per well of 96-well microplate. The biomaterials were previously inserted into the wells (n = 5 for each experimental group) together with the osteogenic culture medium and were incubated at 37°C in the greenhouse with 5% CO<sub>2</sub> to evaluate cell viability (MTT), total protein content and alkaline phosphatase activity (ALP). The results showed that the viable cells in the experimental groups were higher than the control group, with a statistical difference (p<0.05) between the groups, with the sodium incorporation group being the highest. However, in the measurement of total protein content no statistically significant difference was observed between groups (p> 0.05). The ALP values showed a statistical difference between the groups (p<0.05), and the control group was the highest. Therefore, it can be concluded that the materials are not cytotoxic and allowed osteoblastic differentiation.

**Keywords:** Mesenchymal stem cells; Guided tissue regeneration.

**ANTIMICROBIAL ACTIVITY OF THE *PUNIC GRANATUM* GLYCOLIC EXTRACT**

***Atividade antimicrobiana do extrato glicólico de punica granatum***

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Popularly known as pomegranate, *Punicagranatum*, has several biological activities such as anti-inflammatory action, besides demonstrating antimicrobial action on *Streptococcus mutans*. Due to the biological activities that the extract demonstrates, it is necessary to expand studies on different species of microorganisms, thus elucidating their antimicrobial potential. The following work aims to evaluate the antimicrobial activity of *P. granatum* glycolic extract on planktonic cultures of *Staphylococcus aureus*, *Streptococcus mutans*, *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Candida albicans*. The antimicrobial evaluation was performed by the Broth Microdilution method. The MIC (Minimum Inhibitory Concentration) was determined in the well containing the lowest concentration of the extract without turbidity. MMC (Minimal microbicidal concentration) was determined by sowing aliquots of microplate

wells. Pomegranate extract showed antimicrobial action promoting MIC against *S. mutans* and *E. Faecalis* at a concentration of 50 mg / ml, for *S. aureus* was obtained with 25 mg/ml, while for *C. albicans* and *P. aeruginosa* were obtained. with 12.5 and 6.25 mg/mL respectively. CMM was obtained against *S. aureus* at 50 mg/mL, while for *C. albicans* and *P. aeruginosa* it was obtained at 12.5 mg/mL. *P. granatum* extract showed antimicrobial action on planktonic cultures promoting MIC against all microorganisms tested and obtaining CMM against *S. aureus*, *P. aeruginosa* and *C. albicans*.

**Keywords:** Anti-infectives agents; *Punica granatum*; Herbal medicine.

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Basic Research - Undergraduate Students

### **ANTIMICROBIAL ACTIVITY OF GLYCOLIC EXTRACT OF ZIZYPHUS JOAZEIRO MART**

#### ***Atividade antimicrobiana do extrato glicólico de zizyphus joazeiro mart***

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*Zizyphus joazeiro Mart.*, popularly known as Juazeiro, is a plant whose glycolic extract has several therapeutic uses, such as combating dandruff and seborrhea, demonstrating its antifungal potential. However, few studies evaluate the application of the extract on bacteria. Thus, to provide a new therapeutic alternative to the global problem of antimicrobial resistance, the present work aims to evaluate the antimicrobial action of the glycolic extract of *Zizyphus joazeiro Mart.* on planktonic cultures of *Staphylococcus aureus*, *Streptococcus mutans*, *Enterococcus faecalis*, *Pseudomonas aeruginosa* and *Candida albicans*. For antimicrobial evaluation, the Broth Microdilution test was performed. The MIC (Minimum Inhibitory Concentration) was determined in the well containing the lowest concentration of the extract which had no turbidity. MMC (Minimal Microbicide Concentration) was determined by sowing aliquots from microplate wells. The extract showed antimicrobial action promoting MIC over *S. mutans* with a concentration of 50 mg / mL. For *P. aeruginosa* and *C. albicans* the MIC was obtained with 25 mg/mL. The glycolic extract did not promote MIC against *S. aureus*, a result different from that found by Brito et al. (2015) where the alcohol extract promoted MIC with a concentration of 1024 µg/mL. The extract showed antimicrobial action promoting MIC and CMM against planktonic cultures of *P. aeruginosa* and *C. albicans*.

**Keywords:** Anti-infective agents; Herbal medicine.

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Basic Research - Undergraduate Students

### **ANTIMICROBIAL ACTION OF PROPOLIS DYE ON PLANCTONIC CULTURES OF STREPTOCOCCUS PYOGENES AND KLEDSIELLA PNEUMONIAE**

#### ***Ação antimicrobiana da tintura de própolis sobre culturas planctônicas de Streptococcus pyogenes e Klebsiella pneumoniae***

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There are reports that Propolis has presented several biological actions, but the data are still conflicting, so the objective of this study was to evaluate the antimicrobial action of propolis dye at 50% on planktonic cultures of *Streptococcus pyogenes* and *Klebsiella pneumoniae*. For this, propolis Dye was formulated at a concentration of 50% w/V, (50g of propolis resin in 100 ml of cereal alcohol at 92%). The determination of the minimum inhibitory concentration (MIC) and minimum microbicidal concentration (MCM) was used, using the broth Microdilution method, according to the M7-A6 protocol. The test was performed in Microplates of 96 wells, where the propolis dye was diluted in Mueller Hinton broth obtaining 10 different concentrations (12.5% to 0.024%), as control was performed the dilution in alcohol of cereal to 92%. Microbial suspensions standardized at 10<sup>6</sup> CFU/ml were incubated for 24 h in all wells. To determine the MIC, the well that did not present Turbi-Ten was verified. The MCM was determined from the sowing of aliquots in Agar BHI. The propolis Dye promoted CIM and MCM on *S. pyogenes* with a concentration of 1.56%, already *K. pneumoniae* obtained MIC and MCM with 3.12% of the dye. The control applied to *K. pneumoniae* showed results similar to propolis, but in the face of *S. Pyogenes* alcohol did not promote MIC and MCM. It was concluded that Propolis dye showed antimicrobial action on *S. Pyogenes* and *K. pneumoniae* demonstrating to be a possible ally against infections caused by these pathogens.

**Keywords:** Propolis; Anti-infective agents; *Streptococcus pyogenes*; *Klebsiella pneumoniae*.

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Basic Research - Undergraduate Students

### **RUN2 EXPRESSION AND MATURATION OF COLLAGEN FIBERS IN IRRADIATED BONE TISSUE** ***Expressão de run2 e maturação de fibras colágenas em tecido ósseo irradiado***

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To evaluate the influence of radiotherapy on Runx2 protein expression, as well as on the formation and maturation of collagen fibers after implant placement in irradiated tissues of rats. Materials and methods: Forty rats were submitted to radiotherapy that simulated the total dose of 70 Gy in humans. These animals underwent implantation of grade V titanium implants in the right and left femurs. The animals were divided into 4 groups: a) Control group (C): no irradiation, only with implants installed; b) Late irradiation group (IrT): group with implant installation and subsequent irradiation; c) Early irradiation group (IrP): irradiated group and subsequent implant installation; d) Immediate irradiation group (IrI): group with implant installation and irradiation within 24 hours. After 3, 14 and 49 days, the animals were euthanized and the histological slides containing the bone fragments with the implants were subjected to immunohistochemical analysis to analyze Runx2 expression while collagen fiber analysis was performed with Picrosirius Red. Results: Na Immunohistochemical analysis showed low Runx2 expression in all irradiated groups when compared to the control group, with IrI being the most positive among them. The irradiated groups also showed a higher percentage of immature collagen fibers when compared to the control group. Conclusion: All irradiation protocols used promoted impairment in the process of bone neof ormation.

**Keywords:** Head and neck cancer; Radiotherapy; Implants; Oncology.

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**UPRIGHTING OF MOLARS: SYSTEMATIC LITERATURE REVIEW**

***Verticalização de molares: revisão sistemática da literatura***

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A routine problem in the dental clinic is the early loss of deciduous or first permanent molars, resulting in the mesial inclination of the first, second and third molars; depending on the missing or extracted tooth. Their uprighting still a challenge for orthodontists, due to the few anchoring techniques designed for this purpose. The mesial inclination of these teeth directly influences the appearance of premature contacts in centric relation, extrusion of the antagonist, distalization of the premolars, occlusal interferences in laterality and protrusion, vertical bone defects, periodontal pockets; besides difficulties in prosthetic rehabilitations. This literature review aimed to understand the importance of molar uprighting and its intervention techniques. A bibliographic review was performed with article analysis on molar uprighting, using different molar uprighting techniques as a parameter. Indexed articles (PUBMED; LILACS and GOOGLE ACADEMICO) were used with the following key words: uprighting of molars; anchorage in orthodontics; mini-implants. Articles older than 10 years that were not in the English and Portuguese languages were excluded. In this way, we concluded that it is of utmost importance to position the molars in their correct position, allowing normalization of occlusion, periodontal health, root conditions in relation to the occlusal plane and to allow a better prosthetic adaptation parallel to the long axis of the tooth.

**Keywords:** Tooth movement techniques; Orthodontic appliances.

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**MANDIBULAR PROTRACTION APPLIANCE'S EFFECTIVENESS IN CLASS II MALOCCLUSION'S CORRECTION: A LITERATURE REVIEW**

***Efetividade dos aparelhos de protração mandibular na correção de maloclusão de classe II: uma revisão de literatura***

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In Brazilians' clinical practice, there is a high incidence of Class II malocclusions, which causes may be maxillary protrusion, mandibular retraction, or a combination of both. According to the literature, this kind of malocclusion could be caused by the mandibular retraction, an alteration that is present in 33,1% of the patients with deciduous dentition, and in 41% of those with permanent dentition. About 55% of the Brazilian population shows Class II malocclusion. The aim of this study was to review the literature about the mandibular protraction appliance's effectiveness in the correction of Class II malocclusions. For patients in the growth phase, the use of fixed intraoral appliances may represent a promising treatment for the Class II malocclusion correction. Among these, some appliances named mandibular protraction appliances (PM) were developed to promote an orthopedic and dental change, and

stimulate a formative growth of the condyle. In children in the mixed dentition phase, PMs induced a small reduction of the SNA and ANB angles. As conclusion, the PMs were effective in Class II malocclusions due to mandibular retraction, resulting in a decrease of the facial profile's convexity and in a better maxillary-mandibular relation, mostly with a buccal repositioning of the lower incisives, mesialization of lower molars, and up righting of upper incisives.

**Keywords:** Malocclusion, Angle class II; Dental tissue conditioning; Orthodontics.

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03

Clinical Research - Graduate Students

### **MANDIBULAR PROTRACTION APPLIANCE: A SYSTEMATIC REVIEW OF THE LITERATURE**

#### ***Aparelho de protração mandibular (APM): uma revisão sistemática da literatura***

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The mandibular protraction apparatus was created by Coelho in 1995. It is a homemade version of Heberst, and its classic indication for class II correction, stand out for its efficiency, minimal patient collaboration and stability results. These devices cause predominantly dental alveolar modifications that present great clinical versatility, easy preparation and low cost. Fixed functional appliances are a third possibility for the treatment of class II malocclusion without extractions or surgery. A systematic literature review was performed, taking into consideration the following aspects: - Indications; - Advantages and disadvantages; - Description of the apparatus; - Installation and adaptation. Independent of patient collaboration, the construction of the APM is simple and can be manufactured, installed and adapted by the orthodontist. It is a patient-friendly intraoral anchorage device that allows unobtrusive opening and closing of the mouth and has unilateral or bilateral action. . As disadvantages we can mention some fractures of the components and the possibility of injuries of the posterior region of Apm. It should be installed when the bows are aligned and level to the rectangular wires. The upper first molars should be banded and with triple convertible tubes. The arches should be paired with 0.30 steel tie wire. The mandibular protraction apparatus is an effective mechanism capable of correcting a dental class II malocclusion without patient collaboration.

**Keywords:** Orthodontic appliances; Angle class II; Review.

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04

Clinical Research - Graduate Students

### **ORTHODONTIC TREATMENT PROTOCOL IN PERIODONTALLY COMPROMISED PATIENTS: REVIEW OF THE LITERATURE**

#### ***Protocolo de tratamento ortodôntico em paciente com doença periodontal: revisão sistemática da literatura***

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The demand for adult patients for orthodontic treatment has increased for several reasons; among them: the modernization of orthodontic appliances, the need for pre-rehabilitation treatment and an increase in the aesthetic requirement. The purpose of this study was to review of the literature of orthodontic treatment in patients with periodontal disease and the possibility of an orthodontic intervention in patients with severe bone loss. Literature review was carried out with an analysis of 10 articles about adult patients in orthodontic treatment, with a directed approach to eliminate the patient's complaint to establish a physiological occlusal relationship, being limited to the dental arch regions with some aesthetic or functional issue. Indexed journal articles were used (PUBMED, LILACS and GOOGLE SCHOLAR). Due to loss of bone support, the orthodontic treatment of patients with periodontitis should be performed with lower force intensity than that used in healthy patients. In addition, the treatment should be multidisciplinary with constant monitoring of the periodontist. It is possible to conclude that a successful treatment requires periodontal disease to be controlled; with accompaniment of the periodontist in order to perform a safe and efficient orthodontic treatment.

**Keywords:** Orthodontics; Orthodontic anchorage procedures; Periodontics.

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Clinical Research - Graduate Students

**MYOFUNCTIONAL APPLIANCES FOR MALOCCLUSION CORRECTION AND / OR PREVENTION IN CHILDREN AND ADOLESCENTS: REVIEW OF LITERATURE**

***Aparelhos miofuncionais para correções das maloclusões e/ou prevenção em crianças e adolescentes***

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Functional orthopedics of the Jaws is an area of dentistry that studies treatments for malocclusion. These treatments can be performed by stimulating or inhibiting facial and mandibular muscle activity. Myofunctional orthodontics aims to correct muscle dysfunctions first and then perform the conventional orthodontic treatment if necessary. Its main functions are alignment of erupting teeth, myofunctional training to eliminate deleterious habits and mandible positioning to achieve a normal occlusion. This therapy is contraindicated for poorly collaborating patients with posterior crossbites and severe class III. The aim of this study was to review the literature about myofunctional devices in patients at growing phase. The search methodology was established by bibliographic survey of scientific articles from the last 10 years, in the BIREME and GOOGLE SCHOLAR databases. It can be concluded that patients treated with myofunctional appliances had satisfactory responses and corrected most of the malocclusions and deleterious habits. Therefore, the myofunctional appliances can be considered an excellent device to correct or prevent malocclusion.

**Keywords:** Orthodontic appliance design; Orthodontics; Myofunctional Therapy.

**PROTOCOL FOR FIXED ORTHODONTIC APPLIANCES IN THE MIXED DENTITION: A REVIEW OF LITERATURE**

***Protocolo para dentição mista (pdm) em ortodontia fixa: revisão de literatura***

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Living with the parallel aspects of malocclusions that arise in the transition to deciduous and permanent dentition; as esthetic, speech therapy, and deleterious habits, make the orthodontic intervention at early ages necessary. This aim of this study was literature review from 2007 to 2019 in the following databases: Scielo, Google Scholar and PubMed. The aim of this study was to review of the literature about orthodontic movement in deciduous dentition from the PDM philosophy does not cause the acceleration of deciduous rhizolysis. Conclusion: The Protocol for fixed orthodontic appliances in the Mixed Dentition (PDM) technique is an easily adaptable treatment model, performed in the short term, increasing the orthodontic treatment efficiency.

**Keywords:** Orthodontics; Dentition, Mixed; Review.

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**MINIPLATES FOR SKELETAL ANCHORAGE IN ORTHODONTICS: A REVIEW OF LITERATURE**

***Mini placas esqueléticas para ancoragem em ortodontia: revisão de literatura***

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In the majority of orthodontics treatments a large percentage of patient present loss of dental elements. It is importance that there is a satisfactory anchorage to conclude the treatments adequately and functionally, without harming the remaining structures allowing aesthetic and a stable occlusion without relapse in the future. Therefore, orthodontists use the use of miniplates, for several cases such as molar intrusion, open bite correction, anterior verticalization, intrusion of hemiarcs and correction of the occlusal plane. The miniplates technology allows a maximum anchorage, only being possible within orthodontics, without the need for orthognathic surgery. The objective of this literature review is to present the use of miniplates as an alternative for patients who do not have anchorage, allowing previously impossible treatments, quickly and safe. This review was performed with articles from indexed journals (Pubmed, Scielo, Google scholar, Lilacs). In this way was possible to concluded that the use of miniplate is a necessary accessory for orthodontic cases with lack of anchorage, returning the aesthetic function, providing a balanced occlusion and stability.

**Keywords:** Bonne plates; Orthodontics; Skeletal Fixation; Dental Occlusion.

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**ANTERIOR OPEN BIT: SYSTEMATIC REVIEW**

***Mordida aberta anterior: revisão sistemática da literatura***

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This study aimed to present a systematic review of the literature on previous open bite, addressing the different topics such as etiology, the types of appliances used and the treatment for this pathology. Articles were searched in the following databases: Pubmed, Bireme, Scielo and Google Scholar, in Portuguese language referring to the last eleven years, articles found outside this period were excluded. Anterior open bite can be defined as the presence of a negative vertical overlap between the incisal edges of the upper and lower anterior teeth. Being a frequent malocclusion in the child population in both genders; Its etiology is usually associated with deleteric oral habits. Suction habits cause malocclusion, since the presence and degree of severity of its harmful effects will depend on Gaber's triad, which relates frequency, duration and intensity of habits. It is known that the earlier treatment, the greater the chances of result with the lower degree of complexity for treatment. After orthodontic diagnosis it is necessary the interaction of other areas for treatment and stability of the case and the primary support of those responsible. Anterior open bite is a very large and complex subject, requiring early and accurate diagnosis to obtain a better chance of correction, with interceptive orthodontic treatments, with less complexity and satisfactory results, requiring a multidisciplinary team approach.

**Keywords:** Open bite; Orthodontic Appliance Design; Clinical Protocols.

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**SURFACE ELECTROMYOGRAPHY OF THE MASSETER AND ANTERIOR TEMPORAL MUSCLES IN PATIENTS WITH MYOFASCIAL PAIN SUBMITTED TO ACUPUNCTURE**

***Avaliação eletromiográfica dos músculos masseter e temporal anterior em pacientes com dor miofascial submetidos à acupuntura***

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Neuromuscular disorders that occur in the head and neck region have a multifactorial and complex etiology character, mobilizing several areas of health with the aim of reducing or alleviating the symptomatology and the subsequent balance of stomatognathic system. The aim of this study was to evaluate by electromyography the influence of acupuncture on the electrical activity of the superficial masseter and anterior temporal muscles. Ten patients affected by myofascial pain with trigger points located in the mentioned muscles, was subjected to an electromyographic evaluation before and after an acupuncture session. The points of needling which were elected: Large Intestine 4 (LI4), Gall Bladder 34 (GB34) and Stomach 44 (ST44). The EMG recordings were obtained according to the protocol suggested by SENIAM (Surface EMG for non-invasive assessment of muscles) and ISEK (International Society of Eletrophysiology) at rest (R) and maximum voluntary contraction (CMV) in three times:

previously, 5 and 15 minutes after acupuncture. Pain intensity was measured using a visual analogic scale (VAS). Results: acupuncture promoted pain relief and changed the electrical profile of the studied muscles, increasing the maximum contractile activity. EMG record showed that acupuncture provided the lowering "muscle tone" at rest and increased muscular activity in maximum voluntary contraction (CMV).

**Keywords:** Electromyography; Acupuncture.

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Clinical Research - Graduate Students

### **ARE E-CIGS SAFE? AN EVALUATION OF CYTOTOXIC AND CYTOGENETIC DAMAGE IN BUCAL MUCOSA**

*Os e-cigs são seguros? Avaliação de danos citotóxicos e citogenéticos em mucosa bucal.*

Schwarzmeier LÂT, Cruz BS, Ferreira CCP, Carvalho BFC, Alves MGO, Carta CFL, Scholz JR, Almeida JD  
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Electronic cigarettes, also known as e-cigarettes, e-vaporizers, or electronic nicotine delivery systems, are devices that promote the vaporization of nicotine without the burning of tobacco. The aim of this study was to investigate cytogenetic and cytotoxic damage through the evaluation of micronuclei frequency and metanuclear anomalies in the oral mucosa of users of electronic cigarette users compared to smokers of conventional cigarettes, former smokers and non-smokers. The patients were divided into 4 groups: control; e-cig; smokers and former smokers. The samples were collected by means of exfoliative cytology of the lateral region of the tongue and floor of the mouth. The smears obtained were fixed and the slices stained by the Feulgen method for investigation of micronuclei and metanuclear anomalies. A significant difference was observed only between the Smoking and Control groups in the frequency of micronuclei. As for metanuclear anomalies, comparisons in karyolysis were significant between: smokers and control, e-cig and control, as well as e-cig and former smokers; karyorrhexis: only between smoker and control groups; binucleation: between e-cig and former smoker groups, and e-cig and control groups; broken eggs: between e-cig and all other groups; nuclear bud: between e-cig and former smokers, as well as e-cig and control. E-cig users, most former smokers of conventional cigarettes and alcohol users, presented genotoxicity and cytotoxicity in the cells of the oral mucosa.

**Keywords:** Electronic cigarettes; Smoking; Smoking Cessation; Oral mucosa; Micronucleus tests.

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Clinical Research - Graduate Students

### **ORTHODONTIC TREATMENT IN PATIENTS WITH PERIODONTAL DISEASES**

*Tratamento ortodôntico com pacientes portadores de doenças periodontais*

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With dental esthetic in evidence, many patients look to the dentist for esthetic and functional benefits, among those with periodontal disease (PD). PD is one of the most common chronic diseases responsible for tooth loss in adults. Orthodontics corrects the dental position preventing malocclusion, facilitating hygiene and favoring oral health. The use of fixed braces increases the number of periodontopathogenic bacteria, due to the number of accessories attached to the dental surface, so the control of PD is essential during orthodontic treatment. This literature review aimed to present that patients with controlled PD can be submitted to orthodontic therapy, with a differentiated treatment. A bibliographic survey was made in the databases (GOOGLE SCHOLAR, SCIELO and PUBMED) between 2009 and 2017. Patients with PD under control may undergo orthodontic therapy, and orthodontic movement may favor the treatment of intraosseous defects due to stimulation of bone apposition. The decrease in plaque accumulation and dental calculus occurs due to correct alignment and leveling of teeth; However, there is a need for a healthy periodontium and good integration between the orthodontist and the periodontist.

**Keywords:** Periodontal diseases; orthodontics; Review.

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Clinical Research - Graduate Students

#### **DIMENSIONS OF SALIVARY GLANDS IN DOWN SYNDROME PATIENTS**

##### ***Dimensões de glândulas salivares em pacientes com síndrome de down***

Dicieri-Pereira B, Rocha TO, Silva MF, Koga-Ito CY, Lopes SL, Gomes MF, Rode SM.  
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Down syndrome (DS) is a common genetic disorder in humans and is caused by a triplication of all or part of human chromosome 21. It is a complex condition characterized by hypotonia (HP) and masticatory muscle hyperfunction. Masticatory hyperfunction has been linked with hyposalivation, which is commonly observed in quantitative salivary flow analysis. More severe muscle HP in the lower parts of the face is also observed in most patients, a fact that may explain the results of lower saliva viscosity in the lower parts of the face, where the presence of salivary glands is more mucous than serous. The aim of this study was to evaluate a relationship between hyposalivation and the presence of glandular and muscular HP, hypoplasia and reduction of stimuli to salivary glands. Parotid and submandibular glands ultrasound test (US) of 30 Down syndrome patients aged 18 to 45 years old, both male and female, were compared with a US imaging database, which acted as the control group. Until now, examined patients showed hyposalivation through quantitative salivary tests.

**Keywords:** Salivary glands. Muscle hypotonia; Down syndrome; Masticatory muscles; Ultrasonography.

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Clinical Research - Graduate Students

#### **INTEROBSERVER AGREEMENT IN ORAL DYSPLASIA GRADING, ASSOCIATED TO CELL CYCLE RELATED PROTEINS EXPRESSION AND LOSS OF HETEROZIGOSITY**

***Concordância inter-observadores na gradação histológica de leucoplasias orais, expressão de proteínas e a perda de heterozigose***

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Oral leucoplakia (OL) may precede squamous cell carcinoma and its histological grading is subjective. Loss of heterozygosity (LOH) has been reported as a risk predictor of OL malignant transformation. Histological, immunohistochemical and molecular aspects of LO were evaluated to demonstrate its malignant potential: 96 cases of OL were stratified by WHO and Kujan systems by three blinded pathologists and correlated with the immunohistochemical biomarkers (IBs) p53, Ki-67, pRb, and p16. In 25 cases LOH analysis was performed. A moderate concordance among pathologists in both systems (Kendall's correlation) was observed. Weak to moderate correlation among IBs was observed, as well as among IBs and histological grading (Spearman's correlation). Staining for p16 showed agreement with all the other IBs. Ki-67 was the most concordant marker in Kujan's system. The LOH was found in moderate and severe dysplasia for the TP53 (17p13.1) and IFNA (9p21) markers, in two cases each. Greater concordance among pathologists and histological grading and IBs was demonstrated by Kujan's system. In OL, p16 can express alone the diagnoses obtained by all others IBs together and represented an important immunohistochemical marker in the diagnosis of different grades of dysplasia in OL in association with the histopathological grading. LOH could be related to histopathological severity degrees and the greater expression of IBs.

**Keywords:** Oral leucoplakia; Immunohistochemistry; Microsatellite instability; Interobserver variability.

**ESTIMATION OF BONE REPAIR TIME IN TEETH WITH PERIAPICAL LESION TREATED ENDODONTICALLY USING MATHEMATICAL MODELING**

***Estimativa do tempo de reparo ósseo em dentes com lesão periapical tratados endodonticamente utilizando modelagem matemática***

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This study aimed to evaluate the estimated time for bone repair in teeth with periapical lesions after endodontic therapy and to compare the volume of the periapical lesion (in mm<sup>3</sup>) with the aid of a mathematical model after the use of two types of intracanal medication. Thirty-four uniradicular teeth with periapical lesion were endodontic treated and divided into two groups according to the intracanal medications (n=17): G1 - Calcium hydroxide associated with 2% chlorhexidine gel and G2 – Ultracal XS®. The volume of the periapical lesion was determined by periapical radiographs and tomography (CBCT) and were obtained before starting treatment, after endodontic treatment (T1), after 3 months (T2) and after 6 months (T3). After the analysis of the periapical lesion volume through the free access software ITK SNAP-1.4.1 (University of North Carolina, Chapel Hill, NC, USA) at all time periods, data were used to construct a mathematical model that was used to estimate the bone repair time of the lesions. Student's t-tests of independent samples were used to evaluate lesion volume

decrease ( $p < 0.05$ ). Periapical lesion volume decreased in endodontically treated cases and intracanal medication showed no significant difference in bone repair time or periapical lesion volume. There was no difference in the estimation of bone repair time between the evaluated groups, being, on average, 249 days for G1 and 245 days for G2. The use of a mathematical model to estimate bone repair may be a viable alternative to predict the repair time of endodontically treated cases.

**Keywords:** Periapical abscess; Cone-beam computed tomography; Endodontics.

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Clinical Research - Graduate Students

### **EPIDEMIOLOGY AND MICROBIOLOGICAL ANALYSIS OF DENTURE STOMATITIS IN ELDERLY IN THE CITY OF TEFÉ - AMAZONAS**

#### ***Epidemiologia e análise microbiológica de estomatites protéticas em idosos no município de tefé - amazonas***

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Denture stomatitis is characterized by the presence of an erythematous lesion on the patient's hard palate under removable prostheses. This study aimed to describe the prevalence of denture stomatitis, besides identifying *Candida* species and their prevalence in the palatal mucosa. A population-based cross-sectional study was conducted in the municipality of Tefé, Amazonas, in a sample of 484 elderly aged 65 to 74 years old, a representative for rural and urban areas. Data collection occurred through home visits, including oral clinical examinations to evaluate denture stomatitis, using the classification defined by Newton (1992), and the collection of biological material using swabs, which were cultivated on CHROMAgar™ *Candida* medium, and the prevalence of the species was determined by colony coloration and morphology. The collected data were analyzed using Stata/MP 14.0. Denture stomatitis was found in 86 elderly (17.7%), more prevalent in prosthetic users (27.9%), females (74.2%) and individuals living in urban areas (79.1%). The diagnosis was predominantly type I (59.3%). There was yeast growth in all samples of denture stomatitis cases, mainly occurring strictly by *Candida albicans* (62.8%). Through these findings, it was possible to conclude that this condition affects a significant number of the elderly who use dental prostheses, once they act as a reservoir of microorganisms.

**Keywords:** Aged; Denture stomatitis; Candida.

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Clinical Research - Graduate Students

### **DEVELOPMENT AND VALIDATION OF NEW TECHNOLOGIES FOR FIXED PARTIAL DENTURES EDUCATION TEACHING**

#### ***Desenvolvimento e validação de novas tecnologias para o ensino em prótese parcial fixa***

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The first contact of undergraduate students with fixed partial dentures (FPDs) occurs in lectures and laboratory practices during the dentistry course. In theory, professors use different ways to elucidate tooth preparation, showing a concept and fixing the image of an ideal preparation. The present study aimed to evaluate the difficulties of undergraduate students in coronary preparations for FPDs through a questionnaire and by suggesting teaching tools to assist students and professors. Eighty-seven 3rd year dentistry students (2017 and 2018) of UNESP - São José dos Campos, participated in this study. Three methodologies were applied: 1) A mobile application with a database of coronary preparations with a direct comparison of the finished preparation through 2D photos. 2) Dummy with a color scheme that changes colors as its structure is reduced and 3) Practical demonstration projected live during orientated preparation. 78.2% of the students reported the main difficulty being the amount of tooth reduction. The dummy method was preferred by 91.5% of the students and approved by 100%. 98.2% approved the video projection. Respectively, the methods assisted in the visualization of the reduction quantity and preparation sequence. It was concluded that both mannequin and live projection proved to be effective methods and approved as auxiliary didactic resources in the teaching of FPDs. The development of the mobile application as a tool in dental education expands the collection of didactic tools, opening the possibility of the use of teaching technologies in dentistry and stimulates self-criticism and self-analysis of the student.

**Key words:** Dentistry; Fixed Partial Dentures; Educational technology.

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Clinical Research - Graduate Students

#### **COMPARATIVE STUDY BETWEEN TWO SOFTWARE TO OBTAIN THE PULP CAVITY VOLUMETRY AS A FORENSIC TOOL**

##### ***Estudo comparativo entre dois software para obtenção da volumetria da cavidade pulpar como ferramenta forense***

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This study aimed to evaluate the reliability of the pulp chambers and root canals volume values obtained by computed tomography (CBCT) images as a tool in sexual prediction, ethnicity and in the estimation of the chronological age of Brazilian individuals. 2 software - ITK-Snap® (Kitware, New York, USA) and Ondemand 3D® (CyberMed, Seoul, Republic of Korea) were compared in this work. A total of 1190 CBCT exams were selected from 5 geographic regions of Brazil and subdivided according to the proportions of population size, gender, age, and race. Images were exported to the 2 software that calculated the volumes corresponding to the pulp chambers (PC) and canal roots (CR) utilizing semi-automatic segmentation. The Student's t-test was used to compare the mean of the groups, Mann-Whitney's test, chi-square test, and Fisher's test were used for medians comparisons. Box-plot graphs of volumes according to gender and ethnicity were presented for each tooth for each software. To compare volumes with age, scatter plots were used. For the prediction of gender or ethnicity, logistic regression models were constructed and for the prediction of age, a linear regression model was used. The comparison between the software was made using the scatter plot

between measurements. There was no significant difference between the performance of the software, being ITK-Snap the only one to indicate that only the ethnicity of the individuals can be estimated through the canine pulp chamber volume values ( $p = 0.007$ ), and this is higher in white individuals.

**Keywords:** Forensic anthropology; Dental pulp cavity; Ethnic groups; Cone-beam computed tomography.

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Clinical Research - Graduate Students

**PICTOGRAPH SYSTEM FOR DIAGNOSIS MAKING AND DATA MANAGEMENT IN ENDODONTICS**  
*Sistema de pictograma para elaboração de diagnóstico e gerenciamento de dados em endodontia*

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This questionnaire aimed to evaluate the approval of a new pictograph system for teaching endodontic diagnosis by undergraduate and graduate students/endodontist compared to a conventional method. After a presentation to a total of 224 participants explaining the pictograph system, the participants received a standardized questionnaire with three questions. The data were then tabulated and analyzed using the Tukey's test for multiple comparison with ( $P \leq 0.05$ ). The first question was to define the level of education of the participants; the second question about which diagnosis method is preferred; and the third question about the intention of using one of the methods in the professional career. The response rate was 97.7%, the first question showed that 74.10% and 25.90% were undergraduate and graduate students/endodontist respectively. After statistical analysis there was no significant difference between the two groups in both the second and the third questions in which in the second question (71.08% and 62.06%) of undergraduate and graduate student/endodontists respectively preferred the pictograph method over the conventional method, and in the third question (60.24% and 51.72%) of undergraduate and graduate student/endodontists respectively showed interest in using the pictograph method in the professional career. Thus, the pictograph method in endodontic diagnosis is accepted by the majority of undergraduate and graduate students/endodontists. Training and experience affect the diagnosis decision.

**Keywords:** Endodontics; Continuing dental education; Advanced dental education.

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Clinical Research - Graduate Student

**STUDY OF LINEAR MEASURES OF PERIAPICAL LESIONS USING PERIAPICAL TOMOGRAPHS AND RADIOGRAPHS**

*Estudo comparativo das medidas lineares de lesões periapicais utilizando tomografias e radiografias periapicais comparative*

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The objective of this research was to compare linear measurements of periapical lesions using Cone-Beam Computed Tomography (CBCT) and Periapical Radiographs (PR). For this, 19 intraradicular teeth with pulp necrosis and periapical lesion requiring endodontic treatment were selected. After teeth selection, PR and CBCT were obtained before starting endodontic treatment (T1). The teeth were divided into 2 groups according to the intracanal medication used (n = 10): G1 - Calcium hydroxide associated with Chlorhexidine Gel 2% and G2 - Ultracal XS®. New periapical radiographs and tomographs were obtained 6 months after of the finalized treatment (T2). The PR were digitized and the superior-inferior (SI) and mesio-distal (MD) linear measurements of the periapical lesions were evaluated with the Image J® software. With the ITK Snap program, linear measurement of the CBCT in the coronal plane, MD (mesio-distal) and SI (super-inferior), was performed to compare the radiographic and tomographic images at pre-established time periods (T1 and T2). Data were statistically analyzed using ANOVA and Pearson linear correlation. The results showed that there was a good correlation between the linear measurements obtained in the PR and CBCT in the MD ( $r = 0.920$ ) and acceptable in the SI sense ( $r = 0.788$ ), without statistical differences between them. It was concluded that there was a positive correlation between the linear measurements obtained in PR and CBCT and that both methods can be used to measure periapical lesions in an equivalent way.

**Keywords:** Dental Pulp Necrosis; Periapical Tissue; Radiography; Cone-Beam Computed Tomography.

### **DOES THE USE OF ELECTRONIC CIGARETTES PROMOTE CHANGES IN ORAL MUCOSA?**

#### ***O uso do cigarro eletrônico promove alterações em mucosa bucal?***

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This study aimed to evaluate the possible inflammatory and cell maturation alterations of the oral mucosa, resulting from the use of electronic cigarettes. Exfoliative cytology of the lateral tongue border was collected from forty individuals with intact oral mucosa and they were divided into two groups. Control Group (GCO): 20 non-smokers and non-electronic cigarette vaporizers; E-cig Group (GEcig): 20 electronic cigarette vaporizers for at least 6 months. The smears were stained and classified according to the parameters defined by Papanicolaou and Traut (1941). Data were analyzed using GraphPad Prism 5.03 software, using Student's t-test and Spearman's correlation coefficient, both with a significance level of 5%. Weekly intake of alcoholic drinks was increased by almost twice in GEcig when compared to GCO ( $p=0.0151$ ). In the cytological evaluation, GCO was 100% classified as Papanicolaou Class I, while in GEcig, 45% was Class I and 55% Class II ( $p=0.0001$ ). Also, there was a difference between the groups for the evaluation of superficial cells with a nucleus ( $p=0.0004$ ), presence of inflammatory infiltrate ( $p=0.0001$ ), bacterial colonies ( $p = 0.0001$ ) and keratohyalin granules ( $p=0.0006$ ). It was concluded that although E-cig users do not present visible clinical alterations, the smears

already show a significant increase in the presence of inflammatory cells and bacterial colonies, as well as alterations in the cellular maturation pattern of the oral mucosa.

**Keywords:** Electronic Nicotine Delivery Systems, Mouth Mucosa, Smoking, Papanicolaou Test.

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Clinical Research - Graduate Students

**COMPARISON OF DIFFERENT TECHNIQUES IN TREATMENT OF SINGLE GINGIVAL RECESSIONS: PARCIAL RESULTS**

***Comparação entre diferentes técnicas no tratamento de recessões gengivais unitárias: resultados parciais***

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Gingival recession is frequently associated with esthetic complaints and hypersensitivity owing to root exposure in the oral environment. Different periodontal surgical techniques have been described for root coverage, being the association of biomaterials and coronally advanced flap (CAF) considered a promising alternative. The present study compares partial results of using two biomaterials (Mucograft® and Mucoderm®), both associated with the CAF technique for the treatment of gingival recessions. For this, 43 patients presenting single gingival recessions were select and divided into three groups: CAF (coronally advanced flap); CAF+CM (coronally advanced flap associated with the addition of the collagen matrix Mucograft® and CAF+XDM (coronally advanced flap and addition of the xenogeneic dermal matrix Mucoderm®). At 3 months post-procedures, all groups had a significant percentage of root coverage (CAF = 71.65 ± 28.6, CAF + CM = 73.63 ± 25.4 and CAF + XDM = 62.29 ± 24.2; p = 0.6). Complete root coverage was obtained in 23%, 29% and 15% cases treated with CAF, CAF+CM and CAF+XDM, respectively (p = 0.4). To date, the comparison between the groups did not present significant differences and the addition of the biomaterials did not show additional benefits to the isolated CAF technique in terms of root coverage for the treatment of single gingival recession.

**Keywords:** Gingival recession; Tooth Root; Periodontal Ligament.

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Clinical Research - Graduate Students

**USE OF SELF-LIGATING BRACKETS ON THE TREATMENT OF ANTERIOR CROSS BITE IN ADULT PATIENTS**

***Utilização do aparelho autoligado em tratamento de mordida cruzada anterior em pacientes adultos***

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Introduction: The anterior crossbite is characterized by malocclusion between the lower anterior teeth occluding in the protrusion concerning the anterior superior teeth. In cases of

complex treatments, self-ligating brackets present significantly greater efficiency compared to conventional brackets. This study aimed to review the subject through bibliographic research in periodical articles. Methodology: A bibliographic survey was conducted between 2007 and 2019 in the databases Scielo, Google Scholar and PubMed. Articles outside this period and Portuguese and English languages were excluded. Conclusion: It is possible to conclude that the self-ligating brackets present a better performance in the treatment of anterior crossbite as well as in other dental malocclusions.

**Keywords:** Orthodontics; Malocclusion; Orthodontic brackets.

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Clinical Research - Graduate Students

**INFLUENCE OF GLASS IONOMER AND SELF-ADHESIVE CEMENTS ON ALL-CERAMIC CROWNS LONGEVITY: 4 YEARS FOLLOW-UP**

***Influência de cimentos ionoméricos ou resinosos na longevidade de coroas totais cerâmicas: acompanhamento clínico de 4 anos***

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The aim of this randomized clinical trial was to evaluate the influence of glass ionomer cement and self-adhesive cement on all-ceramic crowns longevity. Thirty subjects were selected according to eligibility criteria and received two yttrium stabilized polycrystalline tetragonal zirconia (Y-TZP) crowns (n=60) cemented with glass ionomer cements (MRN - Meron, Voco) or with self-adhesive cement (BFX - Bifix-SE, Voco), in a split-mouth design. The teeth were prepared with a 1 mm wide chamfer margin design; axial reduction of 1.5 mm; and occlusal/incisal reduction of 1.5-2 mm. The finishing line was placed preferably supragingival. The cements were manipulated according to manufacturer's recommendations. The restorations were immediately evaluated after the cementations and after 6, 12, 24, 36 and 48 months using modified USPHS criteria. The Fisher exact test was adopted for comparison between the techniques in each period of evaluation (5%). After 48 months, twenty subjects attended the recall. During the study only one crown of each group was lost retention. Color match, marginal discoloration and adaptation, surface roughness and anatomic form did not showed significant change in all periods evaluated; and there were not secondary caries (p=1.000). It was concluded that the type of cement did not influence the all-ceramic crowns longevity after 48 months. Both cements presented adequate retention rates and biological response.

**Keywords:** Clinical study; Y-TZP ceramic; Glass Ionomer Cements; Self-Curing of Dental Resins.

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Clinical Research - Graduate Students

**COMPARISON BETWEEN XENOGENEIC GRAFT VERSUS CONNECTIVE TISSUE GRAFT FOR THE TREATMENT OF MULTIPLE COMBINED DEFECTS PARTIALLY RESTORED**

***Comparação entre enxerto xenógeno versus tecido conjuntivo para o tratamento de defeitos combinados múltiplos parcialmente restaurados***

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The multiple gingival recessions (MGR) are common clinical finding and are frequently associated with noncarious cervical lesion (NCCL), forming multiple combined defects (MCDs). This condition has a different prognosis when compared with a gingival recession without dental wear associated and often requires a restorative and surgical approach to achieve better aesthetic and functional outcomes. Although the multiple combined defects are common finding there is a lack of evidence about its treatment and the ideal clinical protocol has not been determined. Therefore, the aim of this study was to compare 2 different multidisciplinary protocols. For such purpose, forty patients with MGR associated with NCCLs were enrolled and randomly allocated to the one of the following groups: test group (n=20), partial restoration of cervical lesion (PR) and modified coronally advanced flap (MCAF) for root coverage associated with porcine acellular dermal matrix (XDM), and control group (n=20), PR+MCAF associated with connective tissue graft. The clinical results were assessed in baseline and 3 months post-operatively. At three months, both groups showed significant percentages of combined defect coverage, 79,15±22,0 for control group and 68,7±23,9 for test group ( $p=0,2$ ). Thus, the use of this new XDM could be a potencial alternative to the autologous graft for the treatment of multiple CDs. However, randomized clinical trials with longer follow-up are needed to evaluate the performance of this new collagen matrix.

**Keywords:** Gingival recession; Tooth abrasion; Mucoderm.

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Clinical Research - Graduate Students

**COMPARISON BETWEEN TWO DIFFERENT SURGICAL-RESTORATIVE PROTOCOLS FOR THE TREATMENT OF GINGIVAL RECESSION ASSOCIATED WITH B+ NONCARIOUS CERVICAL LESION**  
*Comparação entre protocolos cirúrgico-restauradores para o tratamento de recessão gengival associada à lesão cervical não-cariosa b+*

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Gingival recession (GR) is frequently associated with noncarious cervical lesion (NCCL), forming a combined defect. Clinical trials assessed different surgical-restorative approaches for optimize the treatment of this type of condition. However, limited scientific evidence is available and the ideal clinical protocol has not been established. Thus, the aim of this randomized clinical trial was to evaluate the performance of the coronally advanced flap (CAF) associated or not with the use of a xenogeneic collagen matrix (XCM). For this purpose, 62 patients presenting RT1 GR associated with B+ NCCL in canines or premolars were randomly allocated to the Control Group (n=31) or Test Group (n=31). Both the test and control groups received partial restoration of the NCCL and surgery for root coverage by means coronally advanced flap, nevertheless it was associated a collagen matrix in the test group. The groups were compared regarding the clinical parameters, the patient-centered outcomes and as regards professional aesthetic evaluation. After 12 months of follow-up, CD coverage rates were 52,83% for the control group and 53,65% for the test group ( $p> 0,05$ ). The test group

resulted in keratinized tissue width and keratinized tissue thickness higher. With respect to the other parameters, significant statistical difference was not observed. Therefore, both treatments were effective and resulted in a significant CD reduction, and the association of the xenogeneic graft provided additional benefits in terms of width and thickness of the keratinized tissue.

**Keywords:** Gingival recession; Dental abrasion.

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Clinical Research - Graduate Student

**POSTOPERATIVE PAIN OF NONSURGICAL SINGLE-VISIT VERSUS MULTIPLE-VISIT  
ENDODONTIC RETREATMENT AND ITS RELATIONSHIP WITH CULTIVABLE BACTERIA  
DOR PÓS-OPERATÓRIA EM RETRATAMENTO ENDODÔNTICO EM SESSÃO ÚNICA E MÚLTIPLAS  
SESSÕES E SUA RELAÇÃO COM MICRO-ORGANISMOS ANAERÓBIOS**

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The aim of this study was: a) to compare the presence of postoperative pain in cases of single-visit (SV) and multiple-visit (MV) endodontic treatment in secondary endodontic infections and periapical lesion; b) correlate the presence of pain after treatment with the microbial load (CFU/mL). Twenty-two teeth were selected following pre-established inclusion and non-inclusion criteria. Teeth were randomly allocated in the SV and MV groups. Samples were collected after removal of the filling material to evaluate by CFU / mL the content of the root canal. After the treatment completion, patients received a visual analog scale to evaluate the presence of postoperative pain (24h, 48h and 7 days after obturation). The data was statistically analyzed by Friedman and Mann-Whitney tests. There was no statistical difference between single-visit (SV) and multiple-visit (MV) regarding the presence of postoperative pain. There was no relationship between the presence of postoperative pain and the microbial load (CFU/mL).

**Keywords:** Microorganisms; Endodontic retreatment; Single-visit.

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Clinical Research - Graduate Student

**CLINICAL AND IMMUNOLOGICAL ANALYSES OF LOW INTENSITY ELECTRIC THERAPY ON  
PALATAL WOUND HEALING. PARCIAL RESULTS  
Avaliação clínica e imunológica da eletroterapia de baixa intensidade no reparo de feridas  
palatinas. Resultados parciais**

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Surgical periodontal procedures may lead to the execution of wounds in the palate region to harvest a free gingival (FGG). However, it has been reported that this approach can cause

some degree of morbidity and discomfort in the handled tissue. Therefore, a treatment for the palatal area is of suitable for helping wound healing. Many strategies have been used in an attempt to accelerate healing; one is the application of an exogenous electrical stimulation. The aim of this study was to evaluate the clinical and biomarkers concentration parameters of 3-month outcomes of electrical stimulation accelerating the repair of wounds from palatal donor areas. Twenty-two patients in need of ridge preservation were enrolled into: SHAM Group - FGG and sham electrical stimulation on the palatal wound or EE Group- FGG and electric electrical stimulation on the palatal wound. An alternating current of 100uA, 9kHz, for 120 seconds in 5 days was used. After 7 days, the mean remaining wound area was  $36.6 \pm 5.0 \text{mm}^2$  for the Sham group and  $30.6 \pm 7.2 \text{mm}^2$  for the EE group ( $p < 0.05$ ). In addition, the mean wound epithelialization was  $18.6 \pm 13.1$  for Sham group and  $30.7 \pm 17.7\%$  for EE group ( $p < 0.05$ ). Groups presented similar tissue thickness after 90 days. Less pain was reported by EE group during 2, 3 and 4 days after surgery ( $p < 0.05$ ). IL-6, IL-10, TNF- $\alpha$ , MCP-1, MMP 2 and 9, TIMP 1 and 2 were reduced in the EE group compared to SHAM group at 7 days after surgery ( $p < 0.01$ ). Increased expression of these occurred in SHAM group from 3 to 7 days ( $p < 0.05$ ). Thus, electrotherapy may accelerate tissue repair.

**Keywords:** Eletrotherapy; Mucogingival Surgery; Palate; Tissue Repair.

#### **USE OF L-PRF MEMBRANES IN IMPLANT PLACEMENT IN ANTERIOR MAXILLA AREA. PARCIAL RESULTS**

*Utilização de membranas de l-prf junto à colocação de implantes unitários em área anterior de maxila: Resultados parciais*

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A second generation of platelet concentrate, called Platelet Rich Fibrin (PRF), has shown positive results with the use of PRF during implant placement, improving soft tissue healing and osseointegration. The aim of this study is to evaluate whether the use of L-PRF membranes associated with implant placement in anterior maxilla presents an increase in soft tissue thickness. Forty-two patients requiring single implant placement in the area were randomly divided into test group (implant + L-PRF) and control group (implant). Surgical procedures were performed by a single operator. Soft tissue thickness rates were assessed at baseline and 3 months after surgery. The partial results (eighteen patients, 9 from each group) showed an increase in buccal soft tissue thickness in the test group at this follow-up time ( $1.82 \pm 0.38 \text{mm}$  to  $2.56 \pm 0.47 \text{mm}$ ), as well as reduction of the buccal bone defect in the region ( $1.94 \pm 0.73 \text{mm}$  to  $1.11 \pm 0.93 \text{mm}$ ). There wasn't intergroup statistically difference at baseline, but there was after three months for the buccal tissue thickness ( $1.95 \pm 0.5 \text{mm}$  in the control group and  $2.56 \pm 0.47 \text{mm}$  in the test group). There was none significant intragroup difference in the control group for the assessed parameters. It is concluded, until the present moment, that the use of L-PRF membranes in the installation of unitary implants increased soft tissue thickness after three months of follow-up.

**Keywords** Dental Implant; Platelet-rich Fibrin.

**INFLUENCE OF A PREVENTIVE PROGRAM ON THE PREVALENCE AND SEVERITY OF EARLY CHILDHOOD DENTAL CARIES**

***Influência de um programa preventivo na prevalência e na severidade da cárie dentária na primeira infância***

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Knowledge about dental disease in a given population is critical to its prevention. Oral health education is an important precursor of health conditions and behavior in health. Thus, the severity of the dental disease will be analyzed and compared, by means of the oral health index (dmf-d index), to 60 children, 6-47 months of age, participants and non-participants of a dental preventive program of ICT-UNESP (CAAE: 82571718.3.0000.0077), for this age group. All the children in the sample were socioeconomically disadvantaged. Statistical analyzes were performed through the Minitab program (version 18.1.2017) and the Student t Test (5%) was used. All children should be classified as disadvantaged socioeconomics. Statistical analysis was performed through Microsoft Excel. About prevalence, children in G1 had no caries (0%) and, in G2, seven of the 30 children in the group had carious lesions (23.3%). About severity, only G2 was analyzed. One child with 8 decayed teeth (3.33%), 3 with 3 decayed teeth (10%) and 3 with 1 decayed tooth (10%). It is suggested that the significant percentage found in G2 is mainly due to the lack of guidelines on diet and hygiene, since they presented 100% of cariogenic diet and 71.43% did not perform oral hygiene at sleep / night, determinant behaviors for the diet development of dental caries. It was concluded that for the children of this study, participation in a preventive dental program in early childhood was essential for oral health. In addition, children not participating in this type of program developed caries disease, some of which were more severe.

**Keywords:** Dental caries; Primary prevention; Oral hygiene; Children.

**SURGICAL MANAGEMENT OF AMELOBLASTOMA: 22-YEAR EXPERIENCE OF A SINGLE INSTITUTION**

***Tratamento cirúrgico do ameloblastoma: Experiência De 22 Anos De Uma Única Instituição***

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Ameloblastoma presents a high rate of relapse after conservative treatment (CT). In view of this, segmental resection has been the most recommended surgical technique for the treatment of this tumor. However, it is questioned whether relapse necessarily implies treatment failure. The objective of this study is to retrospectively analyze the different treatments applied to ameloblastoma over a period of 22 years. Clinical, radiographic data, treatments performed and relapse were evaluated through medical records. The success rate was calculated based on criteria that evaluate other outcomes along with relapse. For analysis

of relapse and treatment success, patients with less than five years of follow-up were excluded. A total of 95 cases were analyzed, being 78 conventional ameloblastoma (CA), 17 unicystic ameloblastomas (UA). There was no predilection for sex and the posterior region of the mandible was the most affected region. Different types of treatment were used, with a predominance CT (87%). 62 cases were available for relapse analysis. The mean follow-up time was 9.5 years. Twelve recurrences were observed, all after the CT, being 11 in CA (22%) and one in UA (8%). The overall success rate for CT was 88% for CA and 100% for UA. The overall success rate for radical treatment was 100%, regardless the type of ameloblastoma. Conservative treatment is an effective therapeutic modality for the treatment of ameloblastoma, despite presenting a higher relapse rate.

**Keywords:** Odontogenic tumor; Ameloblastoma; Conservative treatment.

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Clinical Research - Graduate Students

**PREVALENCE OF ORAL MUCOSAL ALTERATIONS IN ELDERLY RESIDENTS OF RURAL AND URBAN AREAS IN A BRAZILIAN AMAZON MUNICIPALITY**

*Prevalência de lesões de mucosa bucal de idosos residentes de áreas rurais e urbanas em um município da Amazônia brasileira*

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The human aging process implies on several physiological body changes, including in the mouth. Thereby, the elderly become more vulnerable to pathological processes and may present lesions in the oral mucosa. The aim of this study was to analyze the prevalence of oral mucosal lesions in the elderly living in rural and urban areas of an Amazon municipality. A cross-sectional population-based study was conducted in the municipality of Tefé, Amazonas, involving 484 elderly registered in the Primary Care, 325 residents in the urban area and 159 in the rural area. The clinical oral examination was conducted through home visits, following the recommendations of the World Health Organization. Data were analyzed using Stata MP. The results showed that 159 elderly (32.8%) had some type of fundamental lesion in the oral mucosa, totaling 301 diagnosed lesions, ranging from one to eight lesions per person. Most of the elderly, however, presented only one lesion (53.4%) in one mucosal site (65.5%), mainly affecting the palate (45.5%) and with macule type (57.5%). There was no significant difference in prevalence between groups, but tongue and lip lesions were predominant in rural areas, whereas in urban areas, alterations generally involved dental prosthesis backing regions. It was concluded that the elderly in this Amazon region presented a high prevalence of fundamental lesions, and screening is important for the early detection of oral cancer in this population.

**Keywords:** Elderly; Oral mucosa; Amazon.

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01

Clinical Research - Undergraduate Student

**THE IMPORTANCE OF A CORRECT TREATMENT PLANNING THROUGH THE USE OF THE SMILE DESIGN DIGITAL PROTOCOL**

***A importância de um correto planejamento de tratamento através do uso do protocolo digital smile design***

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With the increasing demand for highly personalized treatments in Aesthetic Dentistry, it is interesting to use the Digital Smile Design (DSD) tool in the treatment plans (1). DSD is used to strengthen diagnostic vision, improve communication between specialists, facilitate patient understanding, and increase the predictability of treatments (2). The purpose of this study is to demonstrate, through a clinical study, the importance of the correct treatment planning using DSD. 64-year-old female, melanoderma patient. Anamnesis, clinical examination, photographs, study and functional impression of the upper arch, lower arch impression and semi-adjustable articulator set up. In addition, the DSD protocol on the photographs of the patient was made in the computer. The combination of the photographs and the setup of the total upper denture in the articulator showed that the patient had an inverted smiling curve and posterior crossbite on the left side due to the incorrect relationship between the prosthesis used by the patient. The new upper total denture was submitted to acrylization correcting the three-dimensional positioning of the teeth in relation to the reference lines by the DSD protocol. After the upper prosthesis was installed, the occlusion of the patient was adjusted. Adjustments, finishing and polishing were carried out. The lower arch is still in the provisional stage. Thus, it can be concluded that a correct treatment planning is very important, and that the clinical situation of the patient can be better evidenced by the use of DSD.

**Keywords:** Clinical study; Dentures.

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02

Clinical Research - Undergraduate Student

**KNOWLEDGE AND APPLICATION OF BIOSAFETY PRACTICES BY STUDENTS FROM A SÃO PAULO SCHOOL OF DENTISTRY**

***Conhecimento e aplicação de práticas de biossegurança por graduandos de uma faculdade de odontologia de são paulo***

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Biosafety in Odontology is a set of procedures adopted in order to reduce occupational and infectious disease risks. This research aimed to evaluate the students' knowledge on proper practices regarding biosafety. Transversal study carried out using a self-administered questionnaire. It was observed that the students do the sterilization procedures as follow: 88.13% of the students declared to rinse the instruments; 79.22% of these students do the task using a rubber glove; 98.51% stated they sterilize the instruments; 93.47% answered they sterilize drills, although they do not sterilize rotation pens. Regarding to infection control and

surface treatment 87.53% of the students reported they proceed to disinfection before each session and 92.58% claimed to use mechanical surface-protection barriers. 73.47% informed they avoid, while wearing rubber gloves, contact with objects not related to the treatment and 71.81% expressed to wash their hands before putting the gloves on. Concerning to the adoption of protection equipment for patients, the following results were presented: 69.43% put protection glasses on patients and 80.41% request that patients mouthwash with antiseptic solution before any procedure. The guidance, awareness-raising and continuous evaluation of procedures adopted towards effective practices in control of crossed infectious risks is important to the establishment of adequate techniques in health.

**Keywords:** Containment of biohazards; Sterilization; Disinfection; Environmental exposure; Occupational Exposure.

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03

Clinical Research - Undergraduate Student

### **DOWN SYNDROME, WHEN THERE IS A BONE MATURATION** **Síndrome de Down quando se dá a maturação óssea**

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Down Syndrome (DS) is a genetic disorder that reflects physical and intellectual alterations in their individuals and can be present numerous pathologies and anomalies, so the dentist should be aware of the systemic and stomatognathic system alterations. There are changes regarding the population pattern in general. Individuals with DS have a divergent growth pattern compared to non-carriers and are considered a common feature. According to Moraes et al. (2008) who found a shorter period of bone growth with early maturation in DS compared to non-DS individuals. The objective of this research was to determine bone maturation through the ossification center of individuals with DS by hand and wrist radiographs. We performed 74 hand and wrist radiographs, from 5 to 16 years old, using the Greulich and Pyle Method (1959). Among 74 radiographs, 40 (54%) had bone age below chronological age; 27 (36%) presented bone age above chronological age and 7 (10%) chronological age and bone age were equivalent. Among the radiographs that presented bone age under the chronological age, we observed a difference from 3 months to 2 years and 7 months, in the radiographs with bone age above the chronological one, we observed a difference from 4 months to 1 year and 3 months. We considered until 1 month of difference between chronological and bone age as equivalent. We conclude that there is a tendency for Down Syndrome patients to present bone age under their chronological age.

**Keywords:** Down Syndrome; Age Determination by Skeleton; Radiography.

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04

Clinical Research - Undergraduate student

### **TRANSVERSE FORAMENS OF THE FIRST CERVICAL VERTEBRA (C1) AS FORENSIC TOOL FOR CHRONOLOGICAL AGE ESTIMATE AND SEXUAL PREDICTION**

***Canais vertebrais da primeira vértebra cervical como ferramenta forense para estimativa de idade cronológica e predição sexual***

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The objective of this study was to study the volume of the atlas transverse foramens of the first cervical vertebra (C1) to determine the chronological age (CA) and sexual prediction (SP). A total of 66 ConeBeam Computed Tomography (CBCT) exams were selected from the archive of the ICT-UNESP Radiology Clinic being 37 males and 29 females, to evaluate the volume in mm<sup>3</sup> of those structures. In both genders, the exams were divided into 5 age groups (18 to 30, 31 to 40, 41 to 50, 51 to 60 and over 60 years). All these exams were previously acquired in an i-CAT Next Generation (Imaging Sciences International, PA, USA) with a 0.25mm voxel and Field of View (FOV) protocol that completely covers the cervical vertebrae C1 and C2. All images were exported in the Digital Imaging and Communications in Medicine (DICOM) format and converted to the Analyze format using the MRIcro software, in order to perform the segmentation and consequent volumetry of the right and left transverse foramens in the ITK-SNAP<sup>®</sup> software (Kitware, New York, USA). The results indicated that there was a statistically significant difference between the genders ( $p < 0.05$ ), with values for males superior to those of females in the age groups of 31-40, 41-50 and above 60 years. It was concluded that the mean in mm<sup>3</sup> of the volume of the transverse foramen of C1 was higher in the masculine gender than in the female, evidencing sexual dimorphism in the age groups between 31 and 50 years old and above 60 years of age.

**Keywords:** Cone-Beam Computed Tomography; Anthropology; Forensic Dentistry.

05

Clinical research - Undergraduate students

**CHEMICAL BEHAVIOR OF CARBAMIDE PEROXIDE GELS IN AT-HOME BLEACHING AND PATIENT ACCEPTANCE: CROSSOVER CLINICAL TRIAL**

***Comportamento químico de géis de peróxido de carbamida no clareamento caseiro e aceitação do paciente: estudo clínico cruzado***

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The aim of this study was to evaluate the degradation, pH, and acceptance of subjects in relation to 20-22% carbamide peroxide bleaching gels. Ten subjects were submitted to at-home bleaching with three different composition gels: OPF (Opalescence PF-20%), PNT (Polanight-22%) e WPC (Whiteness Perfect-22%). Hydrogen peroxide was measured by permanganometry, the gel's pH with digital pHmeter and patient acceptance with a questionnaire. The degradation and pH were evaluated with two-way repeated measure ANOVA and Turkey's test and acceptance with Fisher's exact test (5%). There was a significant difference for time ( $p=0,0001$ ), but not for the bleaching gel ( $p=0,6195$ ) and interaction ( $p = 0.2195$ ) factors. The gels in the lower trays showed more degradation in relation to the upper trays ( $p < 0.05$ ). After 45 min, the gels degraded more than 45% compared to the initial concentration. In 120 min, the degradation of the gel was more than 55% and there was an increase in pH in the lower trays. There was no difference in pH of the gels from the beginning

until 60 minutes. There was no significant difference in the answers obtained in relation to patient acceptance. It was concluded that the bleaching gels presented the same degradation pattern, with more evidence in the lower trays. The pH of bleaching gels differs from each other. After 60 min, OPF e PNT showed similar pH values. There was no difference between the gel's pH in the tray between the dental arches, except in 120 min. There was no difference in the acceptance of subjects in relation to bleaching gels.

**Keywords:** Tooth Bleaching Agents; Carbamide peroxide; Clinical Trial.

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06

Clinical research - Undergraduate Students

**ELECTROMIOGRAPHIC EVALUATION OF MASSETER AND TEMPORAL MUSCLES IN ODONTOLOGY STUDENTS: AN ANXIETY CORRELATION STUDY**

***Avaliação eletromiográfica dos músculos masseter e temporal em alunos do curso de odontologia: estudo da correlação com ansiedade***

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In order to correlate anxiety levels with the bilateral masticatory muscles electrical activity evaluation, muscle strength and degree of mouth opening, 22 students of the 1st year of the ICT/Unesp Dentistry course, male and female, with completed dentition, were evaluated (CEP 1,784,621). For eletromiography (EMG) recording, the EMG 800 model electromyograph was used. The STAI t/s scale was used to assess anxiety levels, measuring the trait and state of anxiety. Regarding the results, the students were divided into two groups considering the anxiety level, being G1 with moderate level and G2 with high anxiety level. No individual with low anxiety index was observed. The STAI/t showed that 14 students (63.6%) had moderate level and 08 (36.4%) high level of trait anxiety. Regarding STAI/e, 16 (72.7%) were classified as moderate and 06 (27.3%) with high level of state anxiety. In this study, it was found that the level of anxiety did not change the degree of mouth opening, suggesting that the levels of high and moderate anxiety do not differ when assessing strength and degree of activation of mandibular depressors. It was concluded that the study participants were anxious at the time of the evaluation and present anxiety as a personality trait at moderate and high levels; There was a correlation between electromyographic activity, mandibular force and mouth opening with moderate and high anxiety level, but it was inconclusive as to the impact of anxiety on the motor behavior of the masseter and temporal muscles of the evaluated individuals.

**Keywords:** Electromyography; Masseter muscle; Temporal muscle; Anxiety.

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07

Clinical research - Undergraduate Students

**HEALTH-RELATED QUALITY OF LIFE: NARRATIVE LITERATURE REVIEW**

***Qualidade de vida relacionada à saúde bucal: revisão narrativa de literatura***

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Research on Oral Health-Related Quality of Life (OHRQoL) highlights the importance of its use in the world. The literature review can show indicators of OHRQoL, compiled from previous studies. **OBJECTIVES:** To develop a narrative review of the literature regarding the quality of life assessment instruments related to dentistry and its specialties. The research was conducted in the databases Scielo, PubMed, Science Direct, PUCRS Library, and Wiley Online, from 2007 to 2019, using quality of life, dentistry, oral health, instruments as keywords for research. Thus, articles that had their own generic and/or specific evaluation tools were selected. A table of all data was assembled, listing title, year, dental specialties, assessment tools, database, journal, keywords, and a website link. From 200 items, 25 were selected, which included inclusion criteria from different areas of dentistry. The specific assessment instrument OHIP-14 was predominant while the OHRQoL was the most generally used. This narrative review of the literature demonstrated that Implantology and Buco-Maxillo-Facial are the specialties that most investigate oral health-related quality of life, however, there are few studies related to the theme in Dentistry, in the analyzed period.

**Keywords:** Quality of Life; Dentistry; Oral Health; Review.

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08

Clinical research - Undergraduate students

#### **FIRST CERVICAL VERTEBRA VOLUMETRY IN CBCT IMAGES: FORENSIC TOOL FOR CHRONOLOGICAL AGE ESTIMATION AND SEXUAL PREDICTION**

*Volumetria da primeira vértebra cervical em imagens de tcfc: ferramenta forense para estimativa de idade cronológica e predição sexual*

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The aim of this study was to investigate the performance of the transverse canal volume of the first cervical vertebra (Atlas) in determining the chronological age estimate and sexual prediction. A total of 66 Cone-Beam Computed Tomography (CBCT) exams from the ICT-UNESP Radiology Clinic archive were selected. In both genders, the exams were divided into 5 age groups (18 to 30, 31 to 40, 41-50, 51 to 60 and over 60 years). The exams were acquired using CBCT (i-CAT Next Generation), 0.25 mm voxel and Field of View (FOV) covering the C1 and C2 vertebrae. The images were exported in DICOM format and converted to Analyze format using the MRICro software, for segmentation and consequent volume of the right and left transverse foramen in the ITK-SNAP® software (Kitware, New York, USA). The values of the volumes found were tabulated according to age and gender and then subjected to statistical analysis by Student's t-test for independent samples. The results indicated that there was a statistically significant difference between genders ( $p < 0.05$ ), with values for males higher than females in the age groups of 31-40, 41-50 and over 60 years. It was concluded that the transverse C1 volume was higher in males than in females, showing sexual dimorphism in the age group between 31 and 50 years old and above 60 years old.

**Keywords:** Cone-Beam Computed Tomography; Anthropology; Forensic dentistry.

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**ORAL HEALTH AND QUALITY OF LIFE: A QUESTIONNAIRE APPLIED TO CAREGIVERS OF DISABLED PATIENTS**

*Saúde bucal e qualidade de vida: um questionário aplicado a cuidadores de pacientes portadores de necessidades especiais*

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In general, the person who takes on the greatest responsibilities and cares for a disabled person is a family member called the Primary Family Caregiver (PFC). The quality of life evaluation and knowledge related to oral health, in this scenario, have its importance in thinking about the relationship that is established between the PFC and the patient with special needs. In this study, oral health knowledge was evaluated in order to collaborate with family balance recovery programs. Comparatively, 55 adult individuals were evaluated, divided into 28 family caregivers of patients with special needs assisted at Núcleo de Estudo e Atendimento a Pacientes Especiais (NEAPE) and 27 family members of children attending the Pediatric Dentistry Clinic (Ethical Committee 006/2005). For this, we used a questionnaire prepared by the researchers, applied by interview, about the knowledge of practices used in home management related to oral health care. Both groups had a reasonable level of knowledge and reported dental problems such as tooth decay, restorations, and poor positioning. However, the choice and intake of cariogenic foods were evident, with no consistency between what they know and what they do. No difference was found as to the way the PFC and guardian evaluate the oral health of the child. This study showed a lack of knowledge about oral health, regardless of the groups analyzed, requiring approaches that enable and optimize the education and promotion of oral health for these patients and their families.

**Keywords:** Oral Health; Caregivers; Quality of Life.

**EVALUATION OF FURCATION LESIONS IN PATIENTS WITH GENERALIZED AGGRESSIVE PERIODONTITIS TREATED WITH PERIODONTAL REGENERATION BY TCFC**

*Avaliação de lesões de furca em pacientes com periodontite agressiva generalizada tratadas com regeneração periodontal por meio de tcfc*

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The study aimed to compare possible alterations of maxillary molar furcation lesions - maximum lesion opening area (MLOA) and lesion volume and density (LVD) - by Cone-Beam Computed Tomography (CBCT) images of patients with aggressive periodontitis after regenerative therapy with enamel matrix-derived proteins (EMD). Thus, 2 groups were studied: control (surgery; n = 17) and test group (surgery + EMD; n = 17). It was studied the

relationship between MLOA and LVD, and the success of the used therapy, evaluating the reduction in probing depth ( $\Delta PS$ ) and the gain of horizontal clinical attachment level (CAL). Use OnDemand3D and itk-SNAP 3.4.0 software for TCFC image evaluation. The ANOVA and T-tests were used to study the drugs ( $\Delta PS$  and  $\Delta CAL$ ) without reference values and after 6 months of treatment. No statistically significant differences were observed for both times ( $p > 0.05$ ). Pearson's correlation coefficient was applied, showing concerning  $\Delta PS$ , which in the MLOA surgery group tends to be moderately positive ( $R = 0.45$ ), although there is no statistically significant difference ( $p = 0.06$ ). Regarding the CAL, in surgery + EMD, only the MLOA shows statistically significant ( $p = 0.03$ ), with moderate negative correlation ( $R = -0.5$ ). It was concluded that among the analyzed parameters, MLOA influenced the clinical outcome in the surgery group and that a long-term follow-up is necessary to prove the effectiveness of the regenerative technique applied.

**Key words:** Furcation defects; Molar; Guided Tissue Regeneration; Periodontal; Aggressive Periodontitis; Cone-Beam Computed Tomography.

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11

Clinical research - Undergraduate student

#### **MUSCLE HYPOTONIA IN DOWN SYNDROME: BIODYNAMIC CORRELATION OF THE TEMPORAL AND MASSETER MASTICATORY MUSCLES**

*Hipotonia muscular na síndrome de down: correlação biodinâmica dos músculos mastigatórios temporal e masseter*

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Down Syndrome (DS) is a genetic disorder characterized by generalized muscle hypotonia among other phenotypic anomalies. In the orofacial region, this syndrome conditions masticatory dysfunction, increased salivation, speech disorder and dysphagia. The synchronization of contractile activity of the masseter (M) and temporal (T) muscles was assessed bilaterally, at rest and in function, by surface electromyography (sEMG) in patients with DS and without a disability. Thirty-four young and adult patients of both sexes were randomly selected and divided into two groups: DS ( $n=24$ ) and no disability ( $n=10$ ). The electrical activities of the masseter and temporal muscles were evaluated bilaterally, at rest and during two types of bite clamping force: voluntary maximal contraction (VMC) and habitual maximal intercuspation (HMI). The electromyographic data were submitted to Pearson's correlation analysis ( $r$ ) to evaluate the biodynamic relationships in unilateral (left M-T; right M-T) and bilateral (right M-left M; right T-left T) conditions. A score was made to determine the correlation levels (very weak, weak, moderate and strong). Strong and moderate correlations were evidenced in the non-disability group while weak and very weak were shown by patients in the DS group. Therefore, we concluded that the masseter and temporal muscles presented lower functional synchrony in unilateral and bilateral conditions in the DS group when compared to the non-disability group.

**Keywords:** Down Syndrome; Muscle Hypotonia; Masticatory Muscles.

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**RELATIONSHIP BETWEEN SINUS OSTIUM HEIGHT TO NASAL FOSSA FLOOR AND MAXILLARY SINUS ALTERATIONS BY CBCT**

*Relação entre a altura do óstio sinusal ao assoalho da fossa nasal com as alterações do seio maxilar por meio da tcfc*

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The aim of the study were to report the presence of four maximal changes (mucosal thickening, mucus retention phenomenon, partial veiling and full veiling) in relation to the height between the sinus ostium and the nasal fossa floor using beam computed tomography conical (CBCT). It used 503 CT scans from patients over 21 years old of both genders. Through coronary reconstruction with corrected position, a variation in the anterior-posterior direction of the maxillary sinus region was made to identify and locate the sinus ostium and lining of the nasal fossa. The ostium height measurements and responses of sinus changes were performed in both sides. Ostium height measurements and visualization of sinus changes were performed on both sides. The sinus alterations evaluated were sinus membrane thickening (EMS) from 5 mm, mucus retention phenomenon (FRM), partial veiling (PV) and total veiling (VT). Chi-square or Fisher's exact test were used to calculate the raw odds ratios with 95% confidence intervals. It was found that there is a significant association between height and gender ( $p < 0.0001$ ), with left side measurement ( $p < 0.0001$ ) and presence of FRM ( $p < 0.0162$ ). It can be concluded that there is no relationship between the height of the sinus state and the maximum changes with these changes, despite the higher level of direct relationship with the history of mucus retention.

**Keywords:** Tomography; Cone-Beam Computed; Sinus ostium; Maxillary sinus.

**THE SPHENOID BONE STRUCTURES AS FORENSIC TOOL FOR ESTIMATION OF CHRONOLOGICAL AGE AND SEXUAL PREDICTION**

*Estruturas do osso esfenoide como ferramenta forense para estimativa de idade cronológica e predição sexual*

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The present study aimed to analyze the sphenoidal sinus (ESV) volumes as a forensic tool for estimating chronological age and sexual prediction. A total of 120 Cone-Beam Computed Tomography (CBCT) scans were previously obtained from an i-CAT Next Generation (Imaging Sciences, Hatfield, Pa) CT scan from the archive of the Radiology Clinic of the Institute of Science and Technology ICT-UNESP, being 60 exams from men and 60 from women. These were divided into 05 age groups: 18 to 30 years, 31 to 40 years, 41 to 50 years, 51 to 60 years and over 60 years, composed of 12 exams each. The images were imported into itk-SNAP software ([www.itksnap.org](http://www.itksnap.org)), which the segmentation of the right and left sphenoid sinuses

was performed, and the volume of these structures in mm<sup>3</sup> was obtained. Descriptive statistics were performed to investigate differences in VSE value in right and left sides, and the Pearson correlation coefficient was calculated to establish a possible correlation between age and VSE. It was concluded that larger volumes in men were observed in younger age groups while women in older age groups.

**Keywords:** Tomography; X-rays; Forensic Anthropology; Forensic Dentistry; Age Determination by Skeleton; Analysis for Sex Determination; Sphenoid Sinus.

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01

Laboratory Assays - Graduate Students

**PHYTOTHERAPIC INCORPORATED CHITOSAN NANOFIBERS: INITIAL CONTROLLED RELEASE DRUG STUDY**

***Nanofibras de quitosana incorporadas de agente fitoterápico: estudo inicial de liberação controlada de fármaco***

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The aim of this study was to synthesize and characterize morphologically chitosan nanofibers with the inclusion of thyme (*Thymus vulgaris*) phytotherapeutic, as well as to evaluate the microbiological behavior of these polymeric fiber blankets for microbial inhibition in prosthetic interfaces. For this, a solution of chitosan with thyme inclusion (ChT) was prepared, where after dissolving 0.7g of chitosan in 7mL of trifluoroacetic acid (TFA), a dispersion mixture of 0.05g of thyme essential extract was included. in 3mL dichloromethane (DCM). After that, the solution was submitted to the electrospinning method under different parameters, such as amplitude of electric voltage and distance from capillary to collector. According to the obtained fibers, the preparation of the specimens and neutralization for biofilm formation was performed. ChT membrane discs were dispersed in 96-well microplate wells, followed by the addition of 100µl *C. albicans* inoculum and 100µl Brain Heart infusion broth (BHI - Himedia, Mumbai, India). The microplate was incubated for 24h, after which the culture medium was changed, followed by a further 24h incubation to complete the biofilm formation process. Thus, it was observed that the concentration of herbal medicine inserted in the material was not enough to present an effective inhibition in the growth of *Candida albicans*, thus, it was proved the need to increase the proportional amount of herbal medicine, so that the behavior can be correctly evaluated microbiological analysis of this material.

**Keywords:** Electrochemical; Polymer; Chitosan.

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02

Laboratory Assays - Graduate Students

**THE INFLUENCE ON STRESS DISTRIBUTION BETWEEN DIFFERENT GLASS-FIBER POSTS GEOMETRY**

***Influência de diferentes geometrias de pinos de fibra de vidro na distribuição de tensões***

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The aim of this study was to compare the stress distribution between different Glassfiber posts geometry by the finite element method. Six different glass-fiber posts were selected, cleaned and photographed in a 7.5 X magnification stereomicroscope. Bitmap photomicrographs were used as a background for the models design in the modeling software. Then, an endodontic treated human maxillary incisive was selected and replicated in six models allocated according of the post geometry. Each group had prosthetic crown, dental root, glass-fiber post, endodontic cement and a fixing cylinder. Then, each model was divided into a specific number of nodes and tetrahedral elements. Fixed boundary conditions were applied and each

specimen was subjected to a compressive load at a 45-degree angle relative to its longitudinal axis at a constant intensity of 84 N force on the palatal face of the crown. Each material was considered isotropic and homogeneous, except the glass-fiber post that were considered orthotropic. The results of Maximum Principal Stress were used as failure criterion to the root, post and endodontic cement. It was possible to observe that the fiber post with retentive geometries concentrate more tensile stress in their structure and less in the cement. It was not possible to assume any difference for the stress concentration in the dental root between the groups. Different glass-fiber post geometries influence the stress concentration on the post surface and endodontic cement and must be taken into account during the restorative procedure.

**Keywords:** Fixed Prosthesis Fiber post; Finite element analysis.

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03

Laboratory Assays - Graduate Students

**ANALYSIS OF BIOMECHANICAL TENSIONS IN PERIODONTAL BONE TISSUE by FINITE ELEMENT METHOD**

***Análise das tensões biomecânicas no tecido ósseo periodontal pelo método de elementos finitos***

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This study aims to analyze the stresses and distribution of the finite element method in a tooth model with intact and reduced periodontal support. Six three-dimensional computational models of lower central incisor, medullary and cortical bone and periodontal ligament space were created. Each model presented a unique variation in the distance between the cemento-enamel junction (JAC) and alveolar bone crest (COA) from 1 to 6 mm. It was simulated the application of 100N load with 45° inclination in relation to the axial plane and buccal / lingual direction on the incisal edge of the tooth. All elastic, isotropic, homogeneous, continuous and linear structures were considered. The minimum principal stress (TMP) in bone tissue was qualitatively and quantitatively measured in the AOC and the hard blade. Results showed an increase in TMP in regions of bone adjacent to the tooth (AOC and hard blade) and a reduction in periodontal support. Maximum and minimum TMP values were concentrated in specific areas of the analyzed regions. Statistical differences in magnitude, distribution, and variance of TMPs were found between the groups, the largest in the group with the lowest periodontal support. Each millimeter increased distance JAC-COA reduced the insertion area by 12%. The level of significance was 5%.

**Keywords:** alveolar bone loss; risk factor; Finite element analysis.

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04

Laboratory Assays - Graduate Students

**CHITOSAN AND DNA HYDROGEL FOR PHYTOTHERAPIC PROPHYLAXIS**

***Hidrogel de quitosana e dna para profilaxia fitoterápica***

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The aim of this study was the synthesis and characterization of a Chitosan hydrogel (CS) and DNA with the incorporation of green propolis extract for phytotherapeutic prophylaxis. For this, CS/DNA hydrogels were prepared by emulsion technique. Emulsions were obtained by mixing the aqueous phase of the CS solution (1mL) and DNA solution (1mL) with benzyl alcohol (5 mL) using a high performance dispersion instrument at 34000 rpm min<sup>-1</sup> for 5 minutes. Afterwards, the material was filtered in acetone, placed to dry and finally frozen and then lyophilized. Propolis was incorporated by immersing CS / DNA in a saturated herbal solution for 2h. The specimens were then subjected to Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FTIR), Thermogravimetry (TG) and drug release analyzes in water and artificial saliva at 25 and 37°C. It was possible to observe with SEM that CS / DNA has smooth surface in spinal cord conformation, from the FTIR it was verified effective incorporation of DNA in the material, with TG the characteristic of hydrogel degradation was configured and finally, it was observed effective release. of herbal medicine with significant result in saliva at 37°C. Thus, it was concluded that CS / DNA hydrogels may be promising matrices for herbal drugs delivery.

**Keywords:** Hydrogel; Chitosan; Deoxyribonucleases.

05

Laboratory Assays - Graduate Students

**EVALUATION OF ENAMEL IRRADIATION WITH Nd:YAG LASER, ASSOCIATED OR NOT TO A PHOTOABSORBER, IN THE REDUCTION OF DEMINERALIZATION**

***Avaliação da irradiação do esmalte com nd:yag laser, associada ou não a fotoabsorvedor, na redução da desmineralização***

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The study evaluated Nd:YAG laser parameters, associated or not to a photoabsorber (FA), in the reduction of enamel demineralization. From bovine incisors were obtained 80 specimens (6 mm in diameter and 2 mm in height), which had half of their surfaces protected as control. Initial microhardness (KHN) and FTIR readings were performed, and 8 groups (n = 10) were obtained according to the treatments: G1 (- control): no treatment; G2 (+ control): fluorophosphate; G3 (Nd:YAG 60 mJ / pulse, 10 Hz, 48 J / cm<sup>2</sup>, noncontact (NC)); G4 (FA + Nd:YAG 60 mJ); G5 (Nd:YAG 80 mJ / pulse, 10 Hz, 64 J / cm<sup>2</sup>, NC); G6 (FA + Nd:YAG 80 mJ); G7 (Nd:YAG 100 mJ / pulse, 10 Hz, 80 J / cm<sup>2</sup>, NC); G8 (FA + Nd:YAG 100 mJ). A de-remineralization cycle was performed to induce artificial caries; followed by interferometer (INT), KHN and FTIR readings. KHN data were submitted to 2-way ANOVA (laser and FA) and Tukey/Dunnett tests 5%. There was a lower percentage of KHN loss in groups with FA compared to groups without AF and in group G8 compared to the other experimental groups. FTIR data were submitted to T-test 5%. Compared with G2, higher carbonate (CO<sub>3</sub>) concentrations were found in G4, G6 and G8; phosphate (PO<sub>4</sub><sup>3-</sup>) in G8; lower Amide I concentration in G8 and higher CO<sub>3</sub> / PO<sub>4</sub><sup>3-</sup> ratio in G4 and G6. The interferometry results were submitted to 3-way ANOVA of repeated measures 5%. There were statistically significant differences in the photoabsorber-factor individually and in the time-factor. The FA reduced demineralization; Nd:YAG laser without FA was less

effective than fluoride; The 100mJ Nd:YAG laser with FA was as effective as fluoride in reducing artificial caries.

**Keywords:** Enamel; Demineralization; Caries; Laser; Photoabsorber.

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06

Laboratory Assays - Graduate Students

**ADDITION OF POLYETERIMIDE / POLYMETHYLMETHYLCRYTE NANOFIBERS AND NYLON / POLYMETHYLMETHYLCRYLATE FOR REINFORCEMENT OF DENTISTRY MATERIALS**

***Adição de nanofibras de polieterimida/polimetilmetacrilato e de nylon/polimetilmetacrilato para reforço de materiais odontológicos***

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The aim of this study was to synthesize and characterize morphologically Polyetherimide (PEI) nanofibers (NF) associated with Polymethyl Methacrylate (PMMA) - PP and Nylon nanofibers associated with PMMA - PN, produced by electrospinning. A solution of PEI (0.562g) + PMMA (0.377g) dissolved in 2.5ml chloroform, 0.85ml Dimethylformamide (DMF) and 0.85ml 1,1,2,2 Tetrachloroethane (TCE) and a solution of Nylon (0.4g) dissolved in 4ml HFP + PMMA (0.6g) dissolved in 1.35ml DMF and 1.35ml 1,1,2,2 TCE were prepared. For electrospinning different voltages were used for each solution group (10 to 18 Kv) and 2 distances (8 and 12 cm) between the tip of the needle and the collecting apparatus, originating 12 distinct groups of NF (PN and PP from 1 to 6) that were observed in Scanning Electron Microscopy for defect checking and average diameter calculation. The best parameters were submitted to Energy Dispersion X-ray Spectroscopy and X-ray Diffraction tests. Data were analyzed by ANOVA and Tukey test ( $p < 0.05$ ). From the comparative analysis of the pre-established parameters, the PN4 and PP4 NF standards were the most effective. The PN4 standard (18kV - 10cm) presented an average diameter of  $0.49\mu\text{m}$  and  $0.37\mu\text{m}$  for the PP4 standard (13kV - 12cm). The electrospinning process for the production of hybrid NFs proved to be efficient for the polymers of choice, the variation of the parameters of the electrospinning process influenced the structural morphology of the NFs and the presence of the chosen polymers was confirmed by physicochemical characterization.

**Keywords:** Electrochemistry; Fibers; Polymer.

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07

Laboratory Assays - Graduate Students

**STAINING SUSCEPTIBILITY ANALYSIS OF COMPOSITE RESINS OR PREPOLYMERIZED BLOCKS FOR CAD / CAM**

***Análise da susceptibilidade ao manchamento de resinas compostas ou blocos pré-polimerizados para CAD/CAM***

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The aim of this study was to evaluate the staining susceptibility of light composite resins (CR) for direct use and pre-polymerized block for indirect use by the CAD / CAM technique. One hundred and sixty specimens (n = 20) were made using four direct use CR brands (GD: GrandioSO - Voco; OD: Opallis - FGM; KD: Kalore - GC and ZD: Filtek Z350 supreme– 3M) and four blocks. For indirect use (GI: Grandio Blocs - Voco; BI: Brava - FGM; CI: Cerasmart - GC and LI: Lava Ultimate - 3M). Specimens of 1mm thickness and 6mm diameter were made using light-cured composite resins with the support of a silicone mold. Indirect specimens the CR, of the same dimensions were cut from the blocks. All specimens were properly polished. Initial color readings were taken with the reflectance colorimetric spectrophotometer (CM 2600d - Konica Minolta). The specimens were then immersed in the staining solution broth proposed by the ADA for 15 days with daily changes. After this period the color was again evaluated and the color variation calculated ( $\Delta E^*00$ ). The one-way ANOVA test showed significant differences in the final values. The results for the Tukey test were: GD- 2,16a; OD- 2,20 a; GI: 3,39b, ZD:2,69ab; KD: 2,76ab; CI:2,95ab, BI: 2,51ab e LI:5,15c. It was concluded that all resins showed significant staining, although the largest color change was observed for the Lava ultimate indirect material.

Keywords: Composite resin; CAD/CAM; Color; Staining.

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Laboratory Assays - Graduate Students

#### **WEAR RESISTANCE OF HYBRID CERAMIC STAINED AFTER DIFFERENT SURFACE TREATMENTS**

#### ***Resistência ao desgaste de cerâmica híbrida maquiada após diferentes tratamentos superficiais***

Tribst JPM, Dal Piva AMO, Werner A, Anami LC, Bottino MA, Kleverlaan CJ  
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To evaluate the effect of surface treatment on the external staining wear resistance of a hybrid ceramic material. Slices of hybrid ceramic were divided into 4 (n= 10) groups according to the surface treatment prior to the staining and glaze application (polishing: Pol, acid etching: Ac, sandblasting: Sd or self-etching silane: Ses). The specimens were submitted to the wear tests in ACTA wear machine simulating the presence of food bolus and antagonist (pH 7, 15 N, 1Hz). The wear rate of the stain surface was determined after 7 intervals of 20,000 cycles, using a profilometer. Scanning Electron Microscopy (SEM) analysis was performed to inspect the surface morphology before and after staining, and after wear. The rates were analyzed using two-way ANOVA and Tukey test. The staining wear rates were affected by surface treatment and number of cycles ( $p < 0.001$ ). 100% of the staining was removed after 40,000 for Po, after 60,000 for Ses, after 120,000 for Ac and after 140,000 for Sd. SEM showed similar worn surface morphologies. Al<sub>2</sub>O<sub>3</sub> sandblasting as a surface treatment improved the external staining durability on the hybrid ceramic surface.

**Keywords:** Restorative dental materials; Surface treatments; ACTA wear machine; Wear facet; Wear depth.

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### **STAIN DURABILITY OF DIFFERENT CAD/CAM MATERIALS**

#### ***Durabilidade da caracterização de diferentes materiais para cad/cam***

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This study aimed to compare the staining wear durability of different monolithic ceramics. Specimens of high translucent zirconia (YZHT), zirconia reinforced lithium silicate (ZLS), hybrid ceramic (HC) and feldspathic ceramic (FLD) were divided into four groups (n=10), according to each material staining technique. All specimens were extrinsically characterized according to the manufacturer's recommendation. The specimens were submitted to three-body wear tests in ACTA wear machine, simulating the presence of food bolus and antagonist (pH 7, 15 N, 1 Hz). The stain surface wear rate was determined after 5 intervals of 200,000 cycles, using a profilometer. The ceramic surface before and after staining, and after wear were inspected by Scanning Electron Microscopy (SEM). The wear rates were analyzed using two-way ANOVA and Tukey test. The staining wear rates were affected by ceramic and the cycles number ( $P < 0.001$ ). 100% of staining was on the ceramic surface even after 1,000,000 cycles. Furthermore, FLD showed significant removed after 200,000 cycles for HC, and after 600,000 cycles for YZHT. Staining of ZLS and FLD remained higher staining durability than ZLS. SEM revealed different surface morphologies for each group with and without staining and after the wear test. Ceramics with fired staining showed higher durability compared to the polymerized one. The feldspar ceramic presented superior staining durability, followed by zirconia reinforced lithium silicate and high translucent zirconia.

**Keywords:** Ceramics; Tooth wear; Zirconia; Lithium Silicate; Translucent.

### **EVALUATION OF THE INCIDENCE OF DENTINAL MICRO-CRACKS AFTER RECIPROCATING AND ROTATORY INSTRUMENTATION**

#### ***Avaliação da incidência de micro trincas dentinárias após instrumentação recíproca e rotatória***

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For an endodontic treatment to be successful is necessary to achieve an efficient cleaning and proper modeling of the root canal. However, in clinical practice, some problems may be encountered during the instrumentation, being the micro-cracks formation one of them. The aim of this study was to evaluate the incidence of dentinal micro-cracks in 48 extracted human incisors using stereomicroscope and cone-beam computed tomography, after the root canal preparation with ProDesign S system (Easy, Belo Horizonte, MG, Brazil), in rotatory and reciprocating movement, ProDesign R system (Easy, Belo Horizonte, MG, Brazil) and Reciproc system (VDW, Munich, Germany). Besides, it was aimed to analyze the instrument surface before it is used, after first use and successively until the third use employing a

stereomicroscope and scanning electron microscopy. The results were statistically analyzed by Tukey test at 5%. Dentinal micro-cracks were formed in all groups evaluated, but without significant statistic differences between them. No dentinal micro-cracks were observed in the CBCT analysis. None of the instruments analyzed presented surface fractures, but torsional deformation occurred on the cutting blades after the third use in the stereomicroscope and SEM analysis in all groups. In the SEM analysis, cracks were observed on the surface of ProDesign S (rotating) and ProDesign R instruments after the third use.

**Keywords:** Root canal preparation; Dentin; Endodontics.

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Laboratory Assays - Graduate Students

### **ANTI-EROSIVE EFFECT OF POLYMER-BASED SOLUTIONS ASSOCIATED TO FLUORIDE**

#### ***Efeito anti-erosivo de soluções à base de polímeros associadas à fluoretos***

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Recently, the ability of bioadhesive polymers to reduce dental erosion has been evaluated. The anti-erosive potential of polymers is due to their affinity with the dental structures, forming a protective film on the enamel surface. This study investigated the anti-erosive potential of four polymers: polyoxirane, hydroxypropylmethylcellulose, pectin, and polymethacrylate in solutions simulating mouth rinses, and the effect of their association with sodium fluoride (225 ppm F<sup>-</sup> -F) and with sodium fluoride plus stannous chloride (800 ppm Sn<sup>2+</sup> -FSn). Hydroxyapatite crystals were pre-treated with solutions containing the polymers in two concentrations, associated or not to F and FSn. Deionized water was used as the control. The pH-stabilization method was used to evaluate the hydroxyapatite dissolution. Data were analyzed by two-way ANOVA and Tukey's test (5%). Significant differences were found for the factors experimental solutions and fluoride association (p=0.0001). The combination of the polymers with F and FSn significantly reduced the amount of hydroxyapatite dissolution compared to the polymers-only solutions and control. Polymethacrylate in both concentrations was able to potentiate the anti-erosive effect of F, but it did not affect the protective potential of the FSn solution. The addition of polymethacrylate can improve the sodium fluoride solution protection against tooth erosion.

**Keywords:** Tooh erosion; dental enamel; polymers; sodium fluoride; stannous chloride.

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Laboratory Assays - Graduate Students

### **INFLUENCE OF ND:YAG LASER ON BOND STRENGTH BETWEEN LITHIUM DISILICATE CERAMICS AND HUMAN MOLARS**

#### ***Influência da utilização de laser nd:yag na resistência de união entre cerâmicas de di-silicato de lítio e molares humanos***

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This study aimed to evaluate the influence of Nd:YAG laser irradiation on the bond strength between lithium disilicate ceramics, resin cement and human dentin. Fifty IPS e.max Press ceramic trunk-conical specimens were made and had the smallest diameter surface treated (n=10): 1-Control Group: Each specimen was etched with HF (30 sec), and silanized; 2-Nd: YAG: Nd: YAG laser irradiation (120 mJ and 10 Hz), + acid + silane; 3-Silane + Nd: YAG: acid, + silane, + laser; 4- Nd: YAG + Graphite: Graphite layer, + laser, + acid, + silane; 5- Silane + Graphite + Nd: YAG: acid, + graphite, + silane, + laser. After the treatments, the ceramics were cemented with resin cement (Variolink II, Ivoclar Vivadent) to the dentin surface of human molars worn with the same area of the ceramic surface. After storage for 24h, the tensile test was performed. The results (MPa) were submitted to ANOVA and Tukey tests (5%): Control  $9.42 \pm 2.27a$ ; Nd  $9.66 \pm 2.02a$ ; Sil + Nd  $6.71 \pm 1.88b$ ; Graf + Sil + Nd  $4.55 \pm 1.12c$ ; Graf + Nd  $1.19 \pm 0.32d$ . It was concluded that the surface treatments did not increase the bond strength; Control and Nd: YAG group presented similar results and superior to the others, and the ceramic surface covering with a graphite layer did not increase the bond strength.

**Keywords:** Nd:YAG laser; ceramics; graphite; dentin.

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Laboratory Assays - Graduate Students

#### **MICROSTRUCTURAL CHARACTERIZATION AND FATIGUE RESISTANCE OF HIGH, SUPER AND EXTRA TRANSLUCENT ZIRCONIA**

##### ***Caracterização microestrutural de zircônias de alta, super e extra translucidez***

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Translucent zirconias were created to solve the optical deficiency of conventional zirconia, but any change in microstructure to increase translucency can change its properties. Therefore, this work characterized and analyzed microstructurally high, super and extra translucent zirconia. Ceramic discs were obtained from pre-sintered blocks of high (Vita YZ HT, Vita Zahnfabrik), super (Vita YZ ST, Vita Zahnfabrik) and extra (Vita YZ XT, Vita Zahnfabrik) translucent zirconia. To measure the mechanical properties, Vickers hardness and biaxial flexural strength were performed, for microstructural characterization, X-ray diffraction (XRD) and scanning electron microscopy (SEM). HT, ST and XT zirconia had a mean resistance of  $999,5 \pm 198,8$  Mpa with a hardness of 1421 HV;  $758,2 \pm 290,1$  MPa and 1313 HV; and  $682,4 \pm 146,9$  Mpa and 1529 HV, respectively. In SEM, all zirconia presented similar grain shape, differing only in size. In XRD, all also presented similar crystallization peaks (tetragonal, monoclinic and cubic). It can be concluded that zirconia has similar microstructures, with slight differences that justify differences in translucency and differences in fracture resistance values.

**Keywords:** Zirconia; Flexural Strength; Translucency.

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### **INFLUENCE OF THIOUREA ON THE BLEACHING EFFECT OF HYDROGEN PEROXIDE**

#### ***Influência da tiouréia no efeito clareador do peróxido de hidrogênio***

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The aim of this study was to evaluate thiourea (T) effectiveness as a chemical catalyst on hydrogen peroxide bleaching efficiency. An association of chromogens (red wine, tobacco and coffee) were mixed with hydrogen peroxide to obtain a final concentration of 35%, sodium hydroxide solution for pH adjustment and different concentrations of (T) as a chemical catalyst. Five different concentrations of (T) (0.05%, 0.125%, 0.25%, 0.375% and 0.425%) and a control group (no catalyst added) were tested, with the pH adjusted to 7. After the solutions were done, their baseline color and their peroxide concentration were evaluated using a colorimetric spectrophotometer and an automatic titrator. Readings were repeated after 30 minutes. Two variables were statistically analyzed: color change ( $\Delta E$ ) and the percentage of peroxide concentration reduction. Significant differences were observed for the color change ( $p = 0.0001$ ) and for the  $H_2O_2$  concentration ( $p = 0.0001$ ). Tukey's test result for  $\Delta E$  were: Control ( $20.68 \pm 2.14$ )a, T 0.05% ( $25.24 \pm 3.71$ )a, T 0.125% ( $56.23 \pm 5.92$ )e, T 0.25% ( $50.01 \pm 5.04$ )d, T 0.375% ( $43.29 \pm 3.24$ )c and T 0.425% ( $37.65 \pm 3.28$ )b. Tukey's test result for the percentage of peroxide reduction were: Control ( $0.59 \pm 0.53$ )a, T 0.05% ( $0.70 \pm 0.56$ )a, T 0.125% ( $4.76 \pm 1.28$ )c, T 0.25% ( $4.26 \pm 1.57$ )c, T 0.375% ( $2.50 \pm 0.72$ )b, T 0.425% ( $1.51 \pm 0.81$ )a. The conclusion was that (T) significantly increased the bleaching effect and the consumption of hydrogen peroxide during the reaction, with a strong positive correlation between them, with a maximum effect when 0.125% of (T) was used.

**Keywords:** Hydrogen peroxide; Thiourea; Tooth bleaching.

### **GAPS, VOIDS AND POROSITY OF DIFFERENT MATERIALS IN CASES OF FURCAL PERFORATION: A MICRO-CT ANALYSIS**

#### ***Volume de gaps e voids e porosidade de diferentes materiais em casos de perfuração de furca: análise por micro-ct***

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The aim of this study was to evaluate the volume of gaps (spaces between material and dentin wall) and voids (spaces within material) and the porosity of three different materials: 1) BC Putty: Endosequence BC RRM-Fast Set Putty (BC RRM-FS; Brasseler USA, Savannah, GA); 2) PR-MTA: ProRoot MTA (PRM; Dentsply Tulsa Dental, Tulsa, OK) and 3) BIO: Biodentine (Biodentine Active Biosilicate Technology Scientific File, Septodont, Paris, France) in furcal perforation by computed microtomography (micro-CT). Methods: Cavities were created in the center of the pulp chamber floor of 36 extracted human mandibular teeth using #4 diamond burs with a high-speed handpiece under water cooling. The specimens were randomly assigned into three

groups (n = 12) and the cavities filled. After 7 days, teeth were scanned on micro-CT (Skyscan 1272, Bruker, Belgium). Three-dimensional images were reconstructed, and the percentages of the volume of gaps (VG%) and voids (VV%) and porosity (VP%) of the materials were calculated. Data were submitted to the T-Student test (P <.05). Results: Mean VG% for BC Putty, PR-MTA and BIO were 0.512%, 1.128% and 1.460%, respectively. The mean VV% for BC Putty, PR-MTA and BIO were respectively 0.018%, 0.037% and 0.065% and the VP% was 40.58% (BC Putty); 41.20% (PR-MTA) and 40.80% (BIO). BC Putty group presented a lower percentage of gaps (P.> 05). There was no statistical difference regarding VV% and VP% between the groups. Conclusion: All materials presented similar VV% and VP%. However, BC Putty group presented a lower VG%.

**Keywords:** Gaps; microCT, porosity.

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Laboratorial Assays - Graduate Students

### **SYNTHESIS AND CHARACTERIZATION OF NANOFIBERS USED FOR REINFORCEMENT OF PROSTHETIC RESTORATIONS**

#### ***Síntese e caracterização de nanofibras utilizadas para reforço de restaurações protéticas***

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The purpose of this study was to synthesize and characterize nonwoven acrylonitrile butadiene styrene (ABS), nylon 6 (N6) and polystyrene (PS) nanofibers that will be used to reinforce polymethyl methacrylate. Three solutions were prepared: 1) ABS diluted in dichloromethane and acetone; 2) N6 dissolved in 1,1,1,3,3,3-Hexafluoro-2-propanol; 3) PS, which the dimethylformamide solvent was used. Then, the synthesis of nanofibers was performed by the electrospinning technique. Samples were obtained by varying the tension, the distance from the needle tip and the flow rate at which the solutions were ejected. The morphological characterization was obtained by scanning electron microscopy (SEM) images and the nanofiber diameter measured by Image J software. The physicochemical characterizations were obtained by wettability analysis, X-ray diffraction analysis (XRD) and Fourier Transform Infrared Spectroscopy (FTIR). The applied technique resulted in the synthesis of misaligned nanofibers. From the samples, a pattern was chosen for each solution, based on a comparative analysis of the absence of beads and smaller: fiber diameter, standard deviation and tension used. The nanofibers had a hydrophobic character and the XRD and FTIR tests showed the presence of the polymers. Thus, it is concluded that the technique used is promising for fiber synthesis.

**Keywords:** Electrochemistry; Nanofibers; Polymer.

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Laboratorial Assays - Graduate Students

### **ACTION OF A NEW PROBIOTIC FORMULATION USING GELLAN GUN ON GROWTH AND CARIOGENICITY OF STREPTOCOCCUS MUTANS**

***Ação de uma nova formulação probiótica usando gellan gum sobre o crescimento e cariogenicidade de Streptococcus mutans***

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This study evaluated the antimicrobial effects of Lactobacillus paracasei 28.4 probiotic formulation on planktonic growth, polysaccharide production (PEC) and formation of S. mutans biofilms. Initially, the antibacterial activity of 3 probiotic formulations was tested in planktonic cultures of S. mutans strains. Obtaining total inhibition of S. mutans growth when treated. After that, the effects of the non-biofilm formulation of S. mutans were evaluated. Through the sulfuric-antrona method, it was observed that the production capacity of PEC was reduced by approximately 80%. Antimicrobials of the formulation were evaluated in S. mutans biofilms formed on hydroxyapatite discs, and reductions in viable S. mutans cell counts were found in the treated groups. A reduction in the number of S. mutans cells adhered to the membranes was observed in Scanning Electron Microscopy. By real-time PCR analysis, the effects of the formulations on S. mutans virulence gene expression were tested. This test demonstrated that the S. mutans luxS, brpA, gbpB and gtfB genes were downregulated. It was concluded that probiotic analysis showed L. paracasei 28.4 in gellan gum reduced S. mutans planktonic growth and biofilm, interfering with PEC production, total biomass via cell adhesion, adherence of cells to hydroxyapatite and transcription of virulence genes.

**Keywords:** Lactobacillus paracasei; Streptococcus mutans; Probiotics; Biofilms.

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Laboratorial Assays - Graduate Students

**FAST SINTERING PROTOCOLS DECREASE THE FATIGUE STRENGTH AND MICROSTRUCTURE OF A TRANSLUCENT ZIRCONIA**

***Os protocolos de sinterização rápida diminuem a resistência em fadiga e a microestrutura de uma zircônia translúcida***

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This study investigated the influence of speed sintering on the fatigue strength and microstructure of a translucent Y-TZP (inCoris TZI, Sirona). Sixty ceramic discs ( $\phi=12$  mm; thickness=0.8 mm) were sintered using different speed sintering profiles (n=20): Classic - C (1510 °C, dwell time 120 min), Speed - S (1510 °C, dwell time 25 min) and Super Speed - SS (1580 °C, dwell time 10 min). Then, the discs were stepwise fatigued (10,000 cycles/step; 4Hz; initial load=50N and final load 350N; step size=50N) until failure. The fractographic analysis, surface morphology and grains size were evaluated by SEM and FEG. Fatigue strength data were analyzed using Kaplan-Meier and Mantel-Cox log-rank survival tests and further analyzes were performed using one-way ANOVA and Tukey test, ( $\alpha = 5\%$ ). One-way ANOVA showed a significant difference for the "sintering protocol" factor ( $p < 0.05$ ). S and SS presented similar results ( $512.9 \pm 0.0$ )B, however, lower performance of fatigue strength compared to C ( $570.6 \pm 49$ )A. Also, for grain size measurements, the group S and SS presented similar results  $0.20 \pm 0.04$ B and  $0.20 \pm 0.06$ B, respectively. Though, lower compared to C ( $0.25 \pm 0.06$ )A. The fatigue

survival and strength of sintered zirconia in fast protocols is lower than that obtained using the conventional sintering protocol.

**Keywords:** Y-TZP; Ceramic; Failure analysis.

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Laboratorial Assays - Graduate Students

#### **IN VITRO REMOVAL OF CERAMIC LAMINATED VENEERS WITH ER,Cr:YSGG**

##### ***Remoção in vitro de facetas laminadas em cerâmica com laser er,cr:ysgg***

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Porcelain laminates, commonly called ceramic veneers, have been widely used for aesthetic rehabilitation. To remove them, traditionally the diamond rotary instrument is used, but the laser began to be used to remove facets as a less destructive option. Objectives: Verify that the removal of ceramics veneers by Er,Cr:YSGG laser is efficient without causing damage to the enamel structure. After approval by the Ethics Committee (CAAE97050218.6.0000.0075), enamel blocks with determined surface hardness were used. Lithium disilicate facets were cemented on the enamel with Variolink, RelyXU200 or RelyXVeneer. To remove the facets, the Er,Cr:YSGG laser was used in two parameters (3.5 W, 48.14 J/cm<sup>2</sup> and 3.0 W, 40 J/cm<sup>2</sup>). Before and after irradiation, optical coherence tomography, scanning electron microscopy and X-Ray Dispersive Energy Spectroscopy (OCT, SEM and EDS) analyses were performed. The surface of the dental enamel presented micro-morphological alterations due to the cementation and removal procedures of the laminates. Optical Coherence Tomography showed an increase in the attenuation coefficient of human dental enamel after fragment removal. It is concluded that Er,Cr:YSGG laser, when used in the tested irradiation protocol, seems to be a safe tool in the removal of laminates.

**Keywords:** Optical coherence tomography; Esthetics; Lithium disilicate; Laser.

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Laboratorial Assays - Graduate Students

#### **EFFECT OF DRY OR LUBRICATED SURFACE POLISHING ON THE SURFACE GLOSS COMPOSITE RESIN BEFORE AND AFTER ARTIFICIAL AGEING**

##### ***Efeito do polimento a seco ou lubrificado sobre o brilho superficial de resina composta antes e após envelhecimento artificial***

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There is a lack of reliable evidence about the influence of differences in dry or lubricated polishing devices, and also about the polishing maintenance after aging. The aim of this pilot study was to investigate the superficial gloss of a nanoparticulated resin composite (Filtek Z350xt - 3M ESPE), with dry and lubricated polishing systems before and after brush aging. Eighteen resin composite specimens were fabricated in cylindrical shape and divided into:

control group (no polishing) and polishing system groups (Enhance - DENTSPLY tips, Sof-Lex Pop-on - 3M ESPE, and silicon carbide polishing brush - Astrobrush® - IVOCLAR VIVADENT). Polishing systems were applied dry, lubricated under water-cooling or petroleum jelly. After aging by simulated tooth brushing, the repolishing of the samples was carried out, except in the control group. Subsequently, the groups were subjected to gloss readings, thus verifying the effectiveness of each polishing system. Data for each quantitative evaluation were submitted to repeated-measure analyses of variance. Significant differences were determined ( $p < 0.05$ ). No statistical difference regarding the polishing material and the polishing protocol was found. Differences were found only in relation to the time of the gloss analysis. Results with the highest gloss values were obtained in the initial polishing, which presented values equivalent to those of the polishment. There was a gloss reduction after aging compared to the other values. The conclusion was that the polishing systems and methods do not influence on the gloss of composite resin, and the brush aging reduces this property.

**Keywords:** Aging; Composite resins; Dental polishing.

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Laboratorial Assays - Graduate Students

#### **EFFECT OF DIFFERENT SURFACE TREATMENT PROTOCOLS ON THE BIAXIAL FLEXURAL STRENGTH OF Y-TZP**

##### ***Efeito de diferentes protocolos de tratamentos de superfície na resistência à flexão da ytzp***

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This study aimed at evaluating the effect of different surface treatment protocols for Yttria-Stabilized Tetragonal Zirconia Polycrystals Ceramic (Y-TZP) on biaxial flexural strength (ASTM-F394-78). Specimens were made from disc-shaped Y-TZP ceramic blocks for the biaxial flexion test, and then divided into 5 groups ( $n = 30$ ) according to the type of surface treatment: GCn - None; GR1 - Blasting with Rocatec™ Plus; GR2 - Blasting with Rocatec™ Soft; GG - Glass Beads Blasting; GCp - Application of Signum Zirconia Bond® primer. To evaluate the influence of the proposed treatments on the topography and surface roughness of the Y-TZP, scanning electron microscopy (SEM) and 3D optical profiling analysis were performed on the specimen surfaces. Half of the experimental group specimens were aged by mechanical cycling (106 cycles). The stability of the crystalline phase of Y-TZP was evaluated by X-ray diffraction. All immediate experimental groups ( $n = 15$ ) were tested for flexural strength and the data obtained were submitted to 1-factor ANOVA and Tukey test ( $\alpha = 0.05$ ). The 1-factor ANOVA revealed ( $p = 0.000$ ) the influence of surface treatments on Y-TZP flexural strength. The highest values of flexural strength (MPa) were observed for GR2 ( $1441.6 \pm 290.9$ ) and GR1 ( $1366.2 \pm 126.1$ ). The GG ( $1149.8 \pm 283.5$ ), and GCp - ( $919.1 \pm 123.5$ ) groups were statistically similar to the GCn group ( $979.2 \pm 181.6$ ). Y-TZP surface treatments by blasting with more irregular particles were able to increase the biaxial flexural strength of the material.

**Keywords:** Flexural strength; scanning electron microscopy; Yttria-Stabilized Tetragonal Zirconia Polycrystals Ceramic.

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**CALCIUM ANALYSIS OF GAMMA STERILIZED HUMAN DENTIN SUBMITTED TO GAMMA IRRADIATION**

***ANÁLISE DO CÁLCIO DA DENTINA HUMANA SUBMETIDA À ESTERILIZAÇÃO POR IRRADIAÇÃO GAMA***

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Studies have shown that gamma radiation can modify the oral cavity of patients undergoing radiotherapy. Such changes include xerostomia resulting in the subsaturation of Calcium and Phosphate present in saliva. However, human enamel samples isolated from the oral environment, when irradiated *in vitro* with gamma radiation at doses up to 25 kGy, showed slight micro-morphological alteration. After the approval by the Research Ethics Committee, 20 human dentin samples were randomly divided (n=10) into control group and irradiated group that underwent gamma irradiation (25 kGy) on the Co<sup>60</sup> multipurpose irradiator. Then, Fourier Transform Infrared Spectroscopy (FTIR), % of Surface Microhardness and Scanning Electron Microscopy (SEM) analysis were performed. Finally, the Calcium concentration of the samples from both groups was quantified. The FTIR results showed differences in the organic and inorganic bands. SEM analysis and % loss of surface microhardness corroborate the findings. There was no significant difference in Calcium concentration between control and irradiated groups.

**Keywords:** Calcium; dentin; fourier transform infrared spectroscopy; gamma radiation.

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**EFFECT OF TOOTHBRUSH WEAR ON GLOSS AND ROUGHNESS OF CHAIRSIDE CAD/CAM MATERIALS**

***Efeito da escovação sobre o brilho e rugosidade de materiais chairside para CAD/CAM***

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The longevity of restorative materials can be affected by toothbrushing abrasion. Therefore, this study aimed at evaluating the effect of toothbrushing on the gloss and roughness of different CAD/CAM restorative materials. Cylindrical specimens (n=15) were made up by blocks of the following restorative materials: Hybrid ceramics (CH); Nanoceramic Resin (RN); Leucite-reinforced ceramics (CER); Composite Resin (RC). The specimens were polished with P1200, P2400 and P4000 sandpaper for 30s, 60s, and 120s, respectively. 100,000 movements were performed on an automatic brushing machine containing a slurry made of fluoridated toothpaste and deionized water. Statistical analysis consisted on ANOVA of repeated measure test for roughness and surface gloss results, followed by Tukey test. No statistical difference was found for the initial surface gloss factor for all materials except the RC group, which had the lowest initial gloss. After brushing was verified a statistical difference between groups, the highest gloss was found in the CER group, followed by CH, RN, and RC. The initial roughness

analysis showed no significant differences among the groups. After brushing, the CER group presented the least rough surface, followed by CH and RN, which did not differ from each other. The material with the highest roughness was RC. The conclusion was that materials that have a glassy phase in their composition (CER and CH) have a higher capacity to maintain gloss and roughness.

**Keywords:** Ceramics; CAD-CAM; Surface properties; Toothbrushing.

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Laboratorial Assays - Graduate Students

### **MICROSTRUCTURAL AND MECHANICAL EFFECT OF EXPERIMENTAL GLAZE APPLICATION ON ZIRCONIA**

#### ***Efeito microestrutural e mecânico da aplicação de um glaze experimental sobre zircônia***

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The use of zirconia in Dentistry is due to the need for better mechanical properties in regions subjected to higher chewing loads. For zirconia to have optical properties close to the dental structure it is necessary to apply makeup and glaze. However, some mechanical properties of the material can be reduced with these procedures. As a solution, an experimental glaze was produced using the sol-gel method. The aim of this study was to evaluate how a high thermal compatibility glaze with zirconia affects the mechanical properties. The already sintered zirconia samples (Vita YZ) were divided into two groups: without glaze (Zr) and with glaze (Zrg). The analyses performed were X-ray diffraction, Raman spectroscopy, Vickers hardness, microstructural and flexural strength by Weibull analysis. As a result, there was a reduction in the roughness of Zrg samples, caused by the formation of a highly uniform and porosity-free glass coating, as well as a decrease in their hardness. The glass infiltration in the outer zirconia layer improved the synergy between the materials due to their similarity in the expansion coefficient, generating the formation of monoclinic zirconia at the glass-zirconia interface. The conclusion is that besides acting as an aesthetic coating, the new glaze decreased the roughness and the superficial defects and resulted in an increased flexural strength.

**Keywords:** Ceramics; Flexural strength; Zirconia-based ceramic.

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25

Laboratorial Assays - Graduate Students

### **INFLUENCE OF CHEMICAL AND THERMAL TREATMENTS ON TI-CP DURING THE OSSEOINTEGRATION THROUGH THE FORMATION OF A BIOACTIVE SURFACE**

#### ***Tratamento químico e térmico em ti-cp visando a formação de uma superfície bioativa para otimização da osseointegração***

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Commercially pure titanium (Ti-CP) is used in dental implants due to its good biocompatibility combined with its desired mechanical properties. In recent years, the evolution of surface treatments of Ti-CP has been sought to reduce time and improve the efficiency of the osseointegration process. This study aimed at evaluating the surface modification of Ti-CP grade IV with chemical treatment by immersion in a sodium hydroxide solution (5M NaOH at 60°C for 24h - TQ), followed by a heat treatment (600 ° C / 1h - TQT600 and 900°C / 1h - TQT900). The surfaces were evaluated by X-ray diffraction (XRD) analysis, Raman spectroscopy, scanning electron microscopy (SEM) and dispersive energy spectroscopy (EDS), optical profilometry and wettability analysis. Results showed the formation of a surface containing sodium titanate and TiO<sub>2</sub> in rutile phase after the treatments, in which the oxide formed increases with the treatment temperature heat. The surface texture changed from a seemingly flat surface with machining marks in the control group to a nanometer-scale structure (TQ and TQT600), and to a nanometer needle-like structure (TQT900). Consequently, the surface area increased by 299% respectively in the TQT900 group. The surface changed from partially hydrophilic (control) to hydrophilic (TQ and TQT600) and finally fully hydrophilic, *ie* contact angle 0 °, to the TQT900 group. The results obtained from Ti-cp surface changed after chemical and heat treatment are an indirect indication of the potential improvement in biocompatibility and osseointegration.

**Keywords:** Dental implants; Osseointegration; Titanium.

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01

Laboratorial Assays - Undergraduate Students

## **SUMMARY AND CHARACTERIZATION OF CURCUMIN INCORPORATED POLYLACTIC ACID (PLA) NANOFIBERS**

### ***Síntese e caracterização de nanofibras de ácido polilático (pla) incorporadas de curcumina***

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The present study aimed to synthesize and characterize morphologically polylactic acid nanofibers (PLA) with curcumin inclusion. For this purpose, PLA solution was prepared with 1g of PLA which was dissolved in 7.5ml of chloroform. The solution was kept under stirring at room temperature until complete dissolution of the PLA. Next step 2.5 ml of DMF was added under stirring at room temperature. From the solution of PLA, 1mg curcumin (PLA + N (C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>; PLA + C<sub>15</sub>mg; PLA + N (∅) 2 and PLA + N (CH<sub>3</sub>)<sub>2</sub>) was added to the final PLA solution and allowed to stir. at room temperature, resulting in five solutions: PLA, PLA + N (C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>; PLA + C<sub>15</sub>mg; PLA + N (∅) 2 and PLA + N (CH<sub>3</sub>)<sub>2</sub>. After that, the solutions were submitted to the electrophony method under the parameters 10 cm from the capillary to the collector, 15kV electrical voltage amplitude and 0.7mLh<sup>-1</sup> flow rate. From the fibers obtained, were analyzed by scanning electron microscope to verify the effective formation of fibers. According to the micrographs obtained, it was observed that there was effective fiber formation for all samples (PLA; PLA + N (C<sub>2</sub>H<sub>5</sub>)<sub>2</sub>; PLA + C<sub>15</sub>mg; PLA + N (∅) 2 and PLA + N (CH<sub>3</sub>)<sub>2</sub>), and had no significant formation of fiber defects.

**Keywords:** Electrochemistry; Polymers.

02

Laboratorial Assays - Undergraduate Students

## **CHITOSAN HIDROGEL AND GLYCEROPHOSPHATE DISODIUM SALT WITH POLYCAPROLACTONE NANOFIBERS FOR TISSUE REGENERATIONS**

### ***Hidrogel de quitosana e sal dissódico de glicerofosfato com nanofibras de policaprolactona para regeneração tecidual***

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The aim of this study was to synthesize and characterize the chitosan hydrogel with disodium salt of glycerophosphate (GP) associated to electrospun polycaprolactone (PCL) nanofibers for tissue regeneration. For this propose, a solution was prepared by dissolving 0,5g of PCL in 2 mL of acetone under constant stirring for 12 h. This solution was subjected to the electrospinning process and the fibers collected in a Petri dish. After these steps, chitosan hydrogel (Ch) was made by dissolving 0.4 g of Ch in 19 mL of acetic acid and after 1h, a GP solution was prepared, with 1.7 g of GP dissolved in 1.7 mL of PBS Buffer solution. Finally, the GP solution was added in the Ch solution. The final ChGP solution obtained was placed in the Petri dish, with PCL fibers, and kept under refrigeration (8°C) for 24h. The material was then subjected to the process of total solvent evaporation under room temperature for 24h. Stereomicroscope and

Scanning Electron Microscope for morphological analysis were made in the material. It was possible to observe that the synthesized hydrogel presented heterogeneous conformation. It can be concluded that the association of ChGP + PCL is possible by developing a synthesis pattern for a hydrogel with immersed nanofibers and good handling characteristics.

**Keywords:** Regeneration; Hydrogel; Chitosan.

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03

Laboratorial Assays - Undergraduate Students

**SPECTROPHOTOMETRIC ANALYSIS OF THE INFLUENCE OF SUBSTRATE, CEMENT AND CERAMIC THICKNESS ON THE ESTHETIC RESTORATIONS**

*Análise espectrofotométrica da influência do substrato, do cimento e da espessura de laminados cerâmicos em restaurações estéticas*

Silva PV, Sato TP, Sichi LGB, Ramos MYN, Silva JMF, Araújo RM  
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The aim of this study were to evaluate the effect of the dental substrate, the resin cement and the ceramic thickness in the final color of esthetic restorations. For this propose, 10 bovine crowns, previously separated from the roots were divided into 2 groups of 5 teeth. Each group was exposed to a period in a dye solution: Group A, 0 days and Group C, 15 days. The substrates were included in acrylic resin and worn for enamel exposure. After that, 6 ceramic pieces were produced, with two different thicknesses of 0,6mm and 0,1mm. Three colors of try-in paste (light, neutral and warm) were selected for cementation. The color measurement was made by a digital spectrophotometer and involved the substrates color after the dye exposure, the different ceramic colors and the final color of the set ceramic/try-in/tooth. Thus, it was verified that the try-in warm paste had a smaller  $\Delta E$  than light try-in paste, regardless of the subtract color and the ceramic thickness. The  $\Delta E$  of the 0,6mm ceramics was higher than the  $\Delta E$  of the 0,1mm ceramics. Furthermore, the  $\Delta E$  was higher for the substrates not exposed to the dye substance. Therefore, it is concluded that the color of the dental substrates, the ceramic and the cement, beyond the thickness of the ceramic influence the final color of esthetic restorations.

**Keywords:** Color; Cement; Ceramics.

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04

Laboratorial Assays - Undergraduate Students

**CHITOSAN AND XANTHAN HYDROGEL WITH POLYCAPROLACTONE FIBERS FOR TISSUE REGENERATION**

*Hidrogel de quitosana e xantana com fibras de policaprolactona para regeneração tecidual*

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The aim of this study were to synthesize and characterize morphologically a Chitosan (Ch) and Xanthan (Xa) hydrogel associated to the electrospun nanofibers of polycaprolactone (PCL) for

tissue regeneration applicability. For this propose, a solution was made dissolving 3g of PCL in 2mL of Acetone. After, the solution was subjected to the electrospinning process, obtaining polymeric nanofibers, arranged in a Petri dish. A solution of Ch was prepared using 0.4 g of chitosan dissolved in 17 mL of acetic acid and a solution of Xa was obtained by dissolving 0.2 g of Xa in 10 mL of PBS. After one hour of complete dissolution, Xa solution was mixed in Ch solution under constant stirring. The final solution (ChXa) was placed on the petri dish with PCL fibers and refrigerated for 24 hours. The material was then subjected to the total solvent evaporation under room temperature for extra 24 hours. The hydrogel obtained was characterized according to its morphological analysis in stereomicroscope and scanning electron microscope. It was verified that the synthesized hydrogel showed it as a gelled film, with nanofibers, and good handling characteristics, with the absence of bubbles and homogeneous conformation. Thus, it was possible to define a synthesis standard for a dual phase biomaterial (chitosan hydrogel and xanthan / PCL nanofibers) and a possible application for areas such as guided tissue regeneration.

**Keywords:** Hydrogel; Xanthan; Chitosan.

05

Laboratorial Assays - Undergraduate Students

#### **INFLUENCE OF SURFACE SEALANT APPLICATION AND EROSIVE CHALLENGE ON COLOR CHANGE OF A COMPOSITE RESIN SUBMITTED TO STAINING**

*Influência da aplicação do selante de superfície e desafio erosivo na alteração de cor de uma resina composta submetida a manchamento*

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The purpose of this study was to evaluate the influence of the erosive challenge (DR) and the surface sealant application (SS) in the color change (CR) on a composite resin (RC) submitted to artificial coffee staining (CF). Forty-eight specimens were prepared with composite resin and surface sealant, with or without erosive challenge. The groups were divided into 4 groups (n=12): Group 1- RC+SSà DRà CRà CFà CR; Group 2- RC+SSà CRàCFàCR; Group 3- RCà DRà CRà SSà CFàCR; Group 4- RCàCRàSSàCFàCR. Groups 1 and 3 received erosive challenge for 5 days using hydrochloric acid (HCl 0.01 M, 150 mL/cycle, replaced with each new exposure) at room temperature, for 2 minutes each 4 immersions per day. The surface sealant was applied immediately after the specimen preparation in the groups 1 and 2, and after the first color measurement in the groups 3 and 4. After immersion in coffee solution during 14 days, specimens have had a new color measurement using spectrophotometer (X-Rite Color 962. Danaher Corporation) performed according to CIEL\*a\*b\* color system. The results showed that for  $\Delta E$ , the groups 1 (21,01) and 2 (23,10) presented lower values than G3 (27,76) and G4 (26,57), respectively, while for  $\Delta L$  happened the opposite (G1= -16,84; G2= -17,72; G3= -22,62; G4= -21,22). In the analysis of  $\Delta a$  and  $\Delta b$ , a significant difference was found in  $\Delta b$  of G1 (10,7) only, presenting a lower value. Opacity remained stable for all groups. The resin luminosity decreased, and the color variation increased when the sealant was applied after the erosive cycling and storage.

**Keywords:** Erosive Challenge; Composite Resin; Staining; Surface Sealant

**INFLUENCE OF MODIFIED DENTIN PRIMERS CONTAINING CHLORHEXIDINE DIGLUCONATE ON BOND STRENGTH OF GLASS-FIBER POSTS TO RADICULAR DENTIN**

***Influência de primers dentinários modificados por digluconato de clorexidina na resistência de união de pinos de fibra de vidro em dentina radicular***

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The study evaluated the influence *in vitro* of modified dentin primers containing chlorhexidine digluconate on bond strength of glass fiber posts to radicular dentin. Thirty bovine roots were endodontically treated and prepared for glass-fiber posts. The radicular dentin was etched with 37% phosphoric acid for 15s and conditioned using the conventional primer or the modified primer by aqueous or alcoholic solutions of chlorhexidine 0.12%. A dual-cured resin cement was inserted into the root canals and the posts were positioned for light polymerization for 40s. The samples were transversally sectioned into 3 slices from different radicular regions, and immediately processed for push-out test into a universal test machine with a load-cell of 100Kgf, and speed of 1mm/min. The fractured surfaces were analyzed under a stereomicroscope. The results were submitted to ANOVA test and Tukey with level of significance ( $p < 0.05$ ). The measurements showed no significant differences for bond strength values between groups treated with or without chlorhexidine. Significant differences were observed between the cervical, middle and apical regions. It was concluded that the incorporation of chlorhexidine in dentin primers did not interfere in the immediate bond strength and in the post-aging stability of glass fiber posts in the radicular dentin, regardless of the analyzed depth. Nevertheless, it was demonstrated that, as the depth was increased, the values of bond strength decrease for all studied cementation protocols.

**Keywords:** Chlorhexidine; Dentin; Post and core technique; Tensile strength.

**ANALYSIS OF INVISIBLE ALIGNERS FOR CYTOTOXICITY AND TOPOGRAPHY AFTER THE USE OF HYGIENIZING SUBSTANCES**

***Análise de alinhadores invisíveis quanto a citotoxicidade e topografia após o uso de substâncias higienizadoras***

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The objective of this study were to evaluate the cytotoxicity and the effect of sanitizing solutions on Invisalign aligners' surface topography. Materials and Methods: The samples were obtained by sectioning unused invisible aligners trays, with  $n = 10$  for roughness analysis and  $n = 12$  for cytotoxicity (with 80% power). For roughness: each group was immersed in it designated substance: chlorhexidine gluconate, sodium hypochlorite, sodium perborate, orthophosphoric acid and saline (control group), all of the samples were immersed for 20 minutes, except for orthophosphoric acid which was brushed on for 15 seconds (as directed by

manufacturers). The samples were analyzed seven and fourteen days later, using a digital optical profilometer. Cytotoxicity was evaluated on human keratinocytes (HaCat), which remained in contact with the aligner - without impregnation of any substance. Afterwards, the cells were submitted to the cell viability test (MTT). The statistical design was obtained by the ANOVA repeated measures analysis of variance analysis, complemented by Tukey ( $p < 0.05\%$ ). Results: HaCat strain obtained a 48.8% reduction in viability after contact with Invisalign for 24 hours; in the roughness test, after 15 days of immersion, the groups presented similar roughness. Conclusion: Invisalign did not show cytotoxicity on HaCat strain and there is no difference in roughness to continuous use of substances on Invisalign.

**Keywords:** Invisalign; Sodium hypochlorite; Chlorhexidine.

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08

Laboratorial Assays - Undergraduate Students

**EVALUATION OF MAXIMUM FRACTURE LOAD IN TEMPORARY FIXED PARTIAL PROTHESES REINFORCED BY NYLON MESH**

*Avaliação da carga máxima de fratura em próteses parciais fixas temporárias reforçadas por uma malha de nylon*

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Temporary prostheses aim to plan and analyze the characteristics of the definitive prosthesis, to protect the dentin-pulp complex, to prevent tooth movement and to protect the periodontium. The dentist sometimes confront situations that require prolonged use of temporary crowns. However, materials used for temporary prostheses are often critical for strength. The aim of this study is to evaluate the maximum fracture load in temporary fixed anterior prostheses of three superior anterior elements, made of acrylic resin, containing a nylon and silica structure and which received surface treatment with aluminum oxide. The following experimental groups were established ( $n=10$ ): acrylic resin without nylon mesh (RA), nylon mesh acrylic resin (RAN), surface treated nylon mesh acrylic resin (RANT). In all, 30 specimens were made, which were submitted to the resistance test to maximum fracture load in a universal testing machine. After obtaining the results, statistical analysis was performed and samples from the RANT group obtained higher values of maximum fracture load. It can be concluded that the surface treatment provided better chemical and micromechanical union between fiber and the acrylic resin since nylon mesh treated group showed higher values of maximum fracture load.

**Keywords:** Dental prosthesis; Denture partial temporary; Nylons.

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09

Laboratorial Assays - Undergraduate Students

**STUDY OF THE ROUGHNESS AND SURFACE MORPHOLOGY OF THE ENAMEL OF DECIDUOUS TEETH SUBJECTED TO DIFFERENT PROPHYLACTIC METHODS**

*Estudo da rugosidade e da morfologia superficial do esmalte de dentes decíduos submetidos a diferentes métodos profiláticos*

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Caries disease is a great challenge in dentistry, and the mechanical control of biofilm is the best preventive method. This work aims to perform an in vitro study of the enamel roughness of deciduous teeth submitted to four different prophylactic methods. We selected 32 faces of healthy deciduous teeth, which were divided into 4 groups. In the first group we used a mixture of pumice (SS WHITE)® and distilled water and carried out polishing with a low speed drill with a rubber cup; in the second group we used Clinpro Prophy Paste (3M)® prophylactic paste also with a low speed drill with a rubber cup; in the third group the polishing with sodium bicarbonate jet (Polident); and in the fourth group with a Clinpro Prophy Powder (3M) glycine jet. All procedures were performed by the same calibrated operator in search of clinical reproduction. In each specimen, the procedures were performed for 10 seconds and subsequently, the teeth were washed and stored in distilled water until the time for readings. The readings for measuring surface roughness in micrometers were performed before and after the prophylactic procedures using a Wyko NT1100 INPE apparatus to obtain the Ra value. All the prophylactic methods caused an increase in the Ra value; the bicarbonate group achieved the best results in statistical analysis using the t-Student test tool, which showed there was no initial Ra variation among the 4 groups.

**Keywords:** Dental enamel; Dental prophylaxis; Tooth abrasion; Surface roughness.

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Laboratorial Assays - Undergraduate Students

#### **SYNTHESIS AND CHARACTERIZATION OF PLA NANOFIBERS ASSOCIATED WITH SILVER-DOPED BIOGLASS BY ELECTROSPINNING**

*Síntese e caracterização de nanofibras de pla associado ao biovidro dopado com prata pela técnica de eletrospinning*

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This study aimed to synthesize and morphologically characterize PLA nanofibers associated with bioglass doped with different Silver (Ag) concentrations. Four solutions of PLA (0.5g) dissolved in 3.75mL chloroform were prepared and different proportions of Ag-doped bioglass [10%] (0.05g, 0.1g, 0.2g and 0.3g) were added. After total dissolution in a magnetic stirrer, 1.25mL of dimethylformamide (DMF) was added and was subjected to the electrospinning process after dissolution, using a straight tip needle ( $\varnothing = 0.7\text{mm}^2$ ) and a flow rate of 1mL/hr., for 1 hour. A voltage of 15kV and a 10 cm distance between the needle and the collecting device were used, resulting in 4 experimental groups. For the morphological characterization of the fibers, Scanning Electron Microscopy (SEM) images and diameter measurement using Image J software were used. The chemical composition was evaluated by Dispersive Energy Spectroscopy. Defect-free and misaligned fibers were obtained, with variable diameters ( $3.606 \pm 1.046\text{nm}$ ) to ( $4.893 \pm 3.218\text{nm}$ ). It was verified by using DES that the chemical elements of the materials used were present in the fibers. In this study, it was possible to establish a direct correlation between Ag-doped bioglass concentration and fiber morphology.

**Keywords:** Electrochemistry; Fibers; Bioglass.

**EVALUATION OF TEMPERATURE AND TIME FOR OSTEOTOMY OF BONE BLOCKS WITH PIEZOELECTRIC ULTRASOUND**

***Avaliação da temperatura e tempo de osteotomia de blocos ósseos com piezoelétrico***

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The Piezoelectric Dental System is used to perform clinical and surgical procedures and has advantages over high rotation. This study aimed to evaluate the heat and time for osteotomy of ox-shin bone blocks, using SPO, to know the best relationship between pressure and tip velocity, and to discover the most effective behavior for its use. The blocks had the dimensions of 20x10x5 mm. Five working options were established: Pressure: low (1.76 N) medium (2.7 N) high (4.1 N), high speed (0.052m/s) and low speed (0.023 m/s). Thus, the study was divided into 5 groups; G 1: low speed and medium pressure, G 2: high speed and medium pressure, G 3: high speed and high pressure, G 4: low speed and high pressure, G 5: low speed and low pressure. The flow of water remained constant. The heat was measured with a thermal imager and 3 measurements were taken a per cut. The osteotomy was timed and completed when the cut reached a depth of 5 mm. After analysis of the results and statistics, we concluded that medium pressure was ideal, because high pressure generated a bone overheating (41°C), and low pressure presented a very prolonged osteotomy time (6.1 mins). Regarding speed, we concluded that high speed is more effective for cutting.

**Keywords:** Piezosurgery; Piezoelectric; Temperature; Osteotomy.

**ANTIFUNGAL SCAFFOLD: SYNTHESIS AND PHYSIOCHEMICAL CHARACTERIZATION OF POLYCAPROLACTAN / NYSTATIN NANOFIBERS**

***Scaffold antifúngico: síntese e caracterização físico-químico de nanofibras de policaprolactano/nistatina***

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This research aimed to physiochemically synthesize and characterize nanofibers of polycaprolactan (PCL) with nystatin (NYS). For the synthesis of PCL nanofibers (NFs), the polymer was dissolved in Dimethylformamide (DMF) and 1,1,2,2 Tetrachloroethane (TCE), and three concentrations of NYS (Groups A and B) were added. Electrospinning was performed with the following parameters: 13Kv and 8cm distance for A and B. Samples were analyzed by Scanning Electron Microscopy (SEM), Dispersive Energy Spectroscopy (DES) and X-ray Diffraction Analysis (XRD) and Fourier Transform Spectroscopy (FTIR). The electrospun solutions were for EDS analysis, where it was possible to observe the presence of chemical elements in the samples, thus confirming the presence of PCL and NYS. XRD and FTIR analysis demonstrated the semi-crystallinity of PCL and a tendency towards crystallinity of the NYS. The

nanofibers produced were characterized by physiochemistry where the EDS and XRD analyses proved the presence of the materials studied.

**Keywords:** Nystatin; Candida albicans; Electrochemical.

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Laboratorial Assays - Undergraduate Students

#### **STATISTICAL APPROACHES IN MICRO- AND MACRO-TENSILE TESTS OF BOND STRENGTH**

##### ***Abordagens estatísticas em micro- e macro-tração de resistência de união***

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This study aimed to employ different statistical approaches for data obtained from micro-tensile and macro-tensile tests of bond strength between composite resin and dentin. Forty-eight bovine teeth were sectioned 2 mm below the cement-enamel junction, then embedded in acrylic resin and randomly distributed into four groups (n = 12) for bond strength evaluation. For adhesion tests, Adper Single Bond 2- (SE Bond 2- 3M-ESPE) was used, followed by the application of air-blasting, light curing for 15 sec and insertion of composite resin Z350 XT (3 M-ESPE). The specimens were stored for 24 h at 37°C or artificially aged by thermocycling (5000x, 55-5°C.). For the micro-tensile test groups (G1 24 hrs. storage, and G2 thermocycled) the specimens were cut into sticks of approximately 1 mm<sup>2</sup>. For the macro-tensile test groups (G3 24 hrs. storage, and G4 thermocycled), conical trunk-shaped specimens were obtained where the smaller specimen base (area of 2 mm in diameter) was then submitted to the test. Data were submitted for exploratory analysis; Weibull analysis, parametric approach (2-way ANOVA and Tukey) and Student's t-test. The obtained bond strength data (MPa) were: G1 (modulus; mean ± standard deviation: (2.54; 10.76 ± 4.21); G2 (3.36; 19.34 ± 6.42), G3 (1.96; 3.17 ± 1.51), G4 (1.75; 2.86 ± 1.68). The different statistical strategies indicated the same results.

**Keywords:** Bond strength; Weibull analysis; 2-way ANOVA; Student's t-test.

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Laboratorial Assays - Undergraduate Students

#### **THE INFLUENCE OF ELECTROSPINNING PROCESS PARAMETERS ON NANOFIBER MORPHOLOGY**

##### ***Influência dos parâmetros do processo da eletrofição na morfologia das nanofibras***

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This study aimed to synthesize and characterize Polycaprolactan (PCL)/Nystatin (NYS) nanofibers by using the electrospinning technique. Two solutions (A and B) were obtained: for solution A, 0.045g of NYS was dissolved in 2mL of PCL and, for solution B, 0.090g in 2mL of PCL was dissolved. Then the solutions were subjected to electrospinning by varying the parameters

of injected voltage (10.13 and 15 Kv) and distance from the tip of the needle to the shield (8 and 12cms.) and the flow was maintained at 0.5mL/hr. generating 6 samples for each solution. The morphology of the generated nanofibers was evaluated by scanning electron microscopy (SEM) and the fiber diameter was measured using the IMAGEJ software. The applied technique resulted in the synthesis of misaligned NFs. The diameters for solution A ranged from 1.06 to 1.41 $\mu$ m, while for solution B, diameters ranged from 1.30 to 2.21 $\mu$ m. The best performing parameter for solution A was obtained with 8cms. /13kv (1.06 $\mu$ m), and for solution B was 8cms. /13kv (1.30 $\mu$ m). It was possible to produce PCL fibers with NYS without defects, and the electrospinning parameters influenced the diameter of the obtained fibers.

**Keywords:** Nystatin; *Candida albicans*; electrochemical.

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Laboratorial Assays - Undergraduate Students

#### **ASSESSMENT OF SURFACE GLOSS AND ROUGHNESS OF RESIN COMPOSITE UNDER DIFFERENT POLISHING SYSTEMS**

##### ***Avaliação de brilho e rugosidade superficial de resina composta sob diferentes sistemas de polimento***

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This study aimed to evaluate the effect of different polishing systems on the gloss and surface roughness of composite resin over time. Fifty cylindrical composite resin samples (Amaris, VOCO) were made of silicone matrix and divided into two groups according to the polishing system used: SFE: Sof-Lex Spiral (3M ESPE) - two steps and DMT: Dimanto (VOCO) - single step. Spectral gloss and surface roughness measurements were performed. Resin samples were subjected to aging induced in deionized water for 1 year after polishing. Laboratory analyses were performed after polishing, 6 months and 1 year after polishing. Descriptive statistics consisted of calculating the mean and standard deviation (SD), resulting in roughness (Ra) for the DMT group 0.23 $\pm$ 0.08 after polishing, 0.27  $\pm$  0.09 after 6 months and 0.23  $\pm$  0.07 after 1 year. In the SFE group, the mean and SD were 0.20  $\pm$  0.09, 0.23  $\pm$  0.12 and 0.27  $\pm$  0.20 respectively. Regarding gloss (UB), the means in the DMT group were 35.40  $\pm$  9.52 after polishing, 28.46  $\pm$  8.17 after 6 months and 28.89  $\pm$  7.86 after 1 year. In the PES, 38.95  $\pm$  9.52, 35.64  $\pm$  9.17 and 35.48  $\pm$  10.32 respectively. For data analysis, repeated measures ANOVA was used, followed by the Tukey test ( $\alpha = 0.05$ ). There were no significant differences between the two polishing systems used in the study regarding surface roughness over time. There was a decrease of a spectral gloss with storage in water in the DMT system after 6 months. However, after 1 year the spectral gloss values were not statistically different between the two polishing systems.

**Keywords:** Composite Resins; Dental Polishing; Spectral Gloss.

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**IN VITRO ANALYSIS OF BOND STRENGTH OF PORCELAIN VENEERS AFTER SIMULATION OF HEAD AND NECK RADIOTHERAPY**

***Análise in vitro da resistência de união das facetas laminadas de porcelana após simulação de radioterapia de cabeça e pescoço***

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The demand for aesthetic rehabilitation treatments is increasing, especially among the younger generation; however, occasionally there is the indiscriminate use of ceramic laminates that are replaceable. Thus, veneer cementation in young people is a controversial topic. Patients are susceptible to health problems, such as head and neck cancer, whose radiotherapy treatment can promote changes in enamel compromising the maintenance of the veneers. This study aims to evaluate *in vitro* the bond strength of post-radiation (gamma) and non-ionizing (Er, Cr: YSGG) veneers. The samples of human dental enamel were divided into two groups (n = 10/group): gamma group and control. The veneers were cemented with Variolink® N. Only the gamma group underwent a cumulative dose of ionizing radiation simulating the treatment of head and neck cancer (0.07 kGy). After that, the veneers were removed by laser. The results of SEM, EDS, FTIR and shear test indicate that there was a decrease of interprismatic spaces, generating greater mechanical embedding in the enamel. Removal of veneers with Er, Cr: YSGG laser after ionizing radiation seems to be efficient; however, it may make it difficult to recondition enamel for veneer exchange.

Keywords: Laminated veneers; Oral cancer; Radiotherapy; Laser.

**SYNTHESIS AND CHARACTERIZATION OF SCAFFOLDS OF PCL/BIOGLASS**

***Síntese e caracterização de scaffolds de pcl/biovidro***

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The aim of this study was to produce membranes for tissue regeneration by electrospinning method and to perform their physical/chemical characterization. For this, two solutions were prepared: one with 0.2 g of PCL + 0.15 g of nanometric Bioglass dissolved in 1.5 mL of acetone, and another with 0.2 g of PCL + 0.15 g of micrometric Bioglass dissolved in 1.5 mL of acetone. Both solutions were constantly stirred for 24h. Afterwards, the first solution was placed in a syringe with a metal needle to perform the electrospinning method. Different parameters were adopted, as the voltage variables of 10, 12 and 15 KV, the distance from the needle to the collector of 12 and 15 cm and the flow rate of 1mLh<sup>-1</sup>. After, the second solution was placed in the syringe with metal needle and the electrospinning was performed, following the same parameters. For the morphological membranes characterization, Scanning Electron Microscopy (SEM) and dispersive energy spectroscopy were performed. The parameters that showed best results were 12kV and 12cm. Both bioglass were incorporated into PCL fibers. It

was possible to analyze the surface topography of the membrane through SEM and it was possible to prove the bioglass incorporation with the EDS. Therefore, we can conclude that the incorporation of bioglass in the PCL fiber was effective. Thus, we were able to produce a membrane, which may present favorable features to cellular application in areas of tissue regeneration. Further *in vitro* tests and clinical trials are required.

**Keywords:** Guided tissue regeneration; Materials Testing; Membranes.

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Laboratorial Assays - Undergraduate Students

**FIBER POST USE IN FRACTURE RESISTANCE OF ENDODONTICALLY TREATED AND RESTORED ANTERIOR TEETH – SYSTEMATIC REVIEW AND META-ANALYSIS**

***Uso do pino de fibra na resistência à fratura de dentes anteriores tratados endodonticamente e restaurados – revisão sistemática e metanálise***

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The study aimed to evaluate the fracture resistance of endodontically treated and restored anterior teeth, associated or not with the use of intraradicular fiber post. Search strategies were determined and searches made in the following databases: MEDLINE by PubMed, Scopus, Web of Science, LILACS, The Cochrane Library, and Embase. Data collection and analysis were performed by two independent reviewers who selected potential studies. First, the studies were selected according to the title and abstract. After that, the full texts were read for data extraction and risk of bias evaluation. The data were summarized by meta-analysis. Initially, 10,242 articles were obtained from all databases. In the end, 32 laboratorial studies were selected for qualitative analysis and 30 for meta-analysis. The use of intraradicular fiber posts in endodontically treated and restored teeth showed a favorable result to for fracture resistance (SMD = 0.57[0.15;0.98]; I2 = 90%; p <0.01). According to the pin type (fiberglass, carbon, quartz and zirconia), the use of fiberglass pins was favorable (SMD = 0.93[0.44;1.42]; I2 = 79%; p <0.01). The use of fiber post in endodontically treated teeth with veneers (SMD = 0.74[0.01;1.47]; I2 = 74%; p<0.01) and cervical cavities (SMD = 1.2[0.51;1.88]; I2 = 0%; p = 0.73), was favorable for fracture resistance. The use of glass fiber post is favorable for fracture strength of teeth endodontically treated with some type of restoration.

**Keywords:** Systematic review; Permanent dental restoration; Permanent dentition; Intraradicular retainer technique; Nonvital tooth.

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Laboratorial Assays - Undergraduate Students

**STRESS CONCENTRATION ANALYSIS AT SURFACE AND SUBSURFACE DEFECTS IN LITHIUM DISSILICATE BY THE FINITE ELEMENT METHOD**

***Análise da concentração de tensões em defeitos de superfície e subsuperfície em dissilicato de lítio pelo método de elementos finitos***

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The aim of this study was to evaluate the stress concentration in controlled surface and subsurface defects by finite element analysis (FEA). Five bars (25x4x1.5 mm<sup>3</sup>) were modeled in CAD software and divided into 5 groups according to the shape and location of the defect: GC - control; GE1 - Surface Rounded; GE2 - Spherical subsurface; GP1 - Superficial spike; GP2 Subsurface pyramidal. Defects will have a diagonal or diameter of 250 µm. The bars were exported to CAE software for FEA application by simulating a 4 point bending test following ISO 6872: 2008. The properties of lithium disilicate glass ceramic was attributed in each model. The main maximum stresses were analyzed at the base of the bar and in a central section to gain access to the influence of the defects. The highest values of maximum principal stresses were observed in GP1 (291.96 MPa) followed by GE2 (214.98 MPa) and GE1 (205.42 MPa). The main maximum tension of GP2 group (184.82 Mpa) was lower than the ones of other groups with defects. Group GC presented a value of 105.6 MPa in the base of the bar. The superficial pointed defect was the most susceptible to lead the failure of the lithium disilicate glass ceramic.

**Keywords:** Ceramics; Stress; Finite element analysis.

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Laboratorial Assays - Undergraduate Students

#### **FINITE ELEMENT ANALYSIS OF UPPER ANTERIOR TEETH CONSERVATIVE ACCESS**

#### ***Análise de elementos finitos de abertura coronária conservadora dos dentes anteriores superiores***

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The aim of this study was to evaluate the stress distribution by the finite element analysis (FEA) method in three different types of coronary opening: conservative (CONS), conventional (CONV), invasive (INVA), and healthy tooth as control (CTRL). Upper central incisor was modeled in 3D using Rhinoceros software (5.0 SR8, McNeel) followed by the three types of access cavity. The models were exported to CAE (Engineering Simulation & 3D Design Software - ANSYS) software for mechanical structural analysis and the materials were considered homogeneous, isotropic, linear and in close contact. The base of the set was fixed under an acrylic resin tube. The teeth were loaded (45°/250N) 3 mm above the cingulum, and the failure criterion for the main maximum stress strength was in enamel and dentin. In all groups, the most susceptible area to fracture was found in the incisal coronal area and in the middle of root. The susceptibility to fracture enhanced gradually and minimally in the order CTRL<CONS<CONV<INVA. Flow resin presented higher stress concentration than composite resin. Thus, within the limitations of this methodology it is possible to conclude that the conservative preparation associated with composite resin presented the best mechanical behavior in endodontically treated incisors.

**Keywords:** Finite element analysis; Dental cavity preparation; Conservative treatment

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**ANTI-EROSIVE EFFECT OF SOLUTIONS CONTAINING POLYMETHACRYLATE ASSOCIATED WITH SODIUM FLUORIDE AND TIN CHLORIDE**

***Efeito anti-erosivo de soluções contendo polimetacrilato associado ao fluoreto de sódio e cloreto de estanho***

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Objective: This study investigated the effect of adding a polymethacrylate copolymer – PMA (Eudragit E-100, Evonik Industries) to solutions simulating mouthwashes, as well as the effect of its association with sodium fluoride - F (225 ppm F-) and with sodium fluoride + stannous chloride - FS (800 ppm Sn<sup>2+</sup>), to protect dental structures against erosive challenges. Methods: Experimental solutions (deionized water; F; FS; PMA, PMA + F; PMA + FS) were tested in a de-mineralizing erosive cycling model (citric acid 0.3%, pH 2.6, 5 min, 2x) using bovine enamel specimens. The Knoop microhardness (KHN) values were obtained in four moments and the percentage of demineralization (% Des), re-hardening (% Re) and protection (% Prot) were calculated based on these values. The data obtained were analysed by one-way ANOVA and Tukey's tests (5%). Results: No significant effect was found in relation to the %Des of the experimental solutions (p = 0.793). PMA + F and PMA + FS solutions provided a significant increase (p = 0.0001) in the %Re compared to F and FS solutions, respectively. The PMA + F solution provided a significant increase (p = 0.0001) in the %Prot of the F solution. Conclusion: The addition of PMA is a promising alternative to improving sodium fluoride protection against erosive episodes.

**Keywords:** Tooth erosion; Dental enamel; Polymers.

**EFFECT OF THERMOCYCLING VARIABLES IN THE RESISTANCE TO FLEXION OF COMPOSITE RESINS**

***Efeito de variáveis na ciclagem térmica na resistência à flexão de resinas compostas***

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The objective of this study was to analyze the effect of thermocycling medium (water or mineral oil) on the flexural strength of aesthetic restorative materials, isolating the hydrolytic aging factor when thermocycling in water. Thirty-two bars of each material were made and divided into the groups. After, they were aged in thermal cyler in distilled water or mineral oil (5,000 cycles of 5° to 55° C). The control groups were kept in water and oil at 37°C for the same time used to complete thermocycling. Finally, to evaluate the effects of thermocycling on flexural strength, the 3-point flexion test was used. The data were statistically analyzed by Tukey test. It was observed that the immersion of the sample in water conditioned in an incubator for the same period of cycling time results in similar values of flexural strength. The samples kept in oil presented greater resistance compared to the samples kept in water,

demonstrating the hydrolytic action of water and its plasticizing effect, which resulted in decreased strength and stiffness. The analysis of the aging process in incubator and thermal cycler indicated that the samples submitted to the thermocycling process showed lower flexural strength values, demonstrating that the temperature variation tends to act on the resistance of the samples, regardless of the medium where aging occurred.

**Keywords:** Flexural strength; Composite resins; Mineral oil; Water.

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Laboratorial Assays - Undergraduate Students

### **EFFECT OF TOOTH BLEACHING ON COLOR STABILITY AND SURFACE ROUGHNESS IN BULK FILL COMPOSITE RESTORATIONS**

#### ***Efeito do clareamento na estabilidade de cor e rugosidade em restaurações de resina bulk fill***

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Bulk Fill composites represent a new category of composite resins, which have been widely used in clinical life due to search for technical simplicity. At the same time, the demand for aesthetic procedures such as dental bleaching has increased, highlighting the need for studies and analysis of the properties of Bulk Fill composites. The aim of this study is to evaluate the effect of bleaching on color stability and surface roughness in Bulk Fill resin restorations. Forty specimens were made simulating veneers in Filtek One Bulk Fill composite. Specimens were randomly divided into 4 groups (n = 10). An initial color and roughness measurement was performed, followed by two cycles of 16% carbamide peroxide bleaching, 2 hours per day. The color and surface roughness measurements were assessed between the 7th and 14th day. The measurements were performed using VITA EasyShade Compact, and the surface roughness changes were measured using a surface roughness tester. After this stage, the samples will be immersed in coffee, cola, wine and distilled water (control), according to the initial division of the groups. The partial results obtained showed color modification on the surface of the restorations in 10% of the evaluated samples, after 2 bleaching cycles. Regarding the surface roughness, there was change in all the samples evaluated (100%), after 2 cycles of bleaching. Therefore, it can be concluded that there were changes in color and surface roughness of all groups evaluated, after 14 days of home bleaching.

**Keywords:** Composite resins; Tooth bleaching; Surface properties

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Laboratorial Assays - Undergraduate Students

### **INFLUENCE OF THICKENING TYPE AND VISCOSITY OF THE CLEARING GEL IN PENETRATION OF HYDROGEN PEROXIDE THROUGH DENTAL STRUCTURE**

#### ***Influência do tipo de espessante e da viscosidade do gel clareador na penetração do peróxido de hidrogênio através da estrutura dental***

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The aim of this study is to evaluate the influence of the thickening agent and viscosity of 35% hydrogen peroxide gel on peroxide penetration through the dental structure. Bleaching gels were prepared containing five different types of thickening agents, namely Salcare, Carbopol, Aristoflex, Aerosil and Carboxymethylcellulose (CMC), which were added in sufficient quantities to produce gels with low viscosity (50,000 cP), medium (250,000 cP) and high (1,000,000 cP). The gels were applied to the enamel surface for 45 minutes and the amount of peroxide that passed through the samples was determined by absorbance spectrophotometry. Carbopol gels resulted in significantly lower penetration than when only the H<sub>2</sub>O<sub>2</sub> solution was employed. Aristoflex resulted in greater penetration than Carbopol, but compatible with commercial control. Salcare showed a behavior very similar to Aristoflex in terms of penetration and viscosity effect. CMC gels resulted in the lowest penetration of all groups, especially for those groups with the highest viscosity. For the groups in which Aerosil was used, pulp penetration was higher than that observed in any other group, being similar to the thickener-free peroxide solution. We concluded that the type of thickener influences peroxide penetration through the dental structure. In addition, CMC and Carbopol resulted in the lowest peroxide penetration, and Aerosil the largest. Increased viscosity reduces peroxide penetration.

**Keywords:** Whitening; Hydrogen peroxide; Viscosity; Thickener; Penetration; Pulp.

#### **EVALUATION OF MARGINAL GAP OCCURRENCE IN COMPOSITE RESIN RESTORATIONS** *Avaliação da ocorrência da fenda marginal em restaurações de resina composta*

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The aim of this study was to evaluate the marginal gap area in the interface between dentin and composite resin using different types of flow composite resin, with and without thermomechanical cycling. Standardized cavities were performed using diamond bur (3286P, KG Sorensen, Brazil) in 60 incisive bovine teeth. Universal Single Bond (3M) adhesive system and the composites FB - Filtek Bulk Fill Flow (3M-ESPE), AF - Admira Fusion Flow (VOCO) and FZ - Filtek Z350 XT Flow (3M-ESPE) were used. Half of each group was submitted to thermomechanical aging (TC): 120,000 mechanical cycles (4 Hz, 30 N load) and 5,000 thermal cycles. Evaluations of marginal gap area were performed by optical microscopy Discovery V20 (ZEISS). The mean and standard deviation values of the marginal gap area ( $\mu\text{m}^2$ ) obtained in the 6 groups studied were: FB - 332,75 $\pm$ 214,76; AF - 376,20 $\pm$ 196,04; FZ - 861,12 $\pm$ 393,68; FB-TC - 951,68 $\pm$ 273,67; AF-TC - 598,82 $\pm$ 392,60; FZ-TC - 1157,59 $\pm$ 563,76. Data were subjected to two-way ANOVA (composite resin and thermomechanical aging) with  $p=0.001$  for both factors. Tukey test (5%) showed mean and standard deviation ( $\mu\text{m}^2$ ) for thermomechanical cycling factor: Cycling = 902,70 $\pm$ 455,37<sup>a</sup>; No cycling = 523,35 $\pm$ 345,28<sup>b</sup> and for composite resin factor: FZ = 1009,36 $\pm$ 466,43<sup>a</sup>; FB = 642,21 $\pm$ 399,27<sup>ab</sup>; AF = 487,51 $\pm$ 307,80<sup>b</sup>. It was concluded that the thermomechanical cycling increased the marginal gap area, and the composite resin AF showed better results than FZ one. The FB composite showed no statistical difference compared to the others.

**Keywords:** Composite resins; Tooth crown; Dentin.

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