

## Periodontics

### Radiographic evaluation of the alveolar bone tissue after induction of periodontal disease in rats

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The aim of the present study was to evaluate radiographically, the effects of the adaptation of ligature in the alveolar bone. Thirty rats were used for this study. The ligature was randomly adapted either on right or left side in the mandibular first molar. The side without ligature was used as control (negative). Ligature was removed immediately after its adaptation. Ten animals were sacrificed at each period of 0, 3 and 7 days. Mandibles were then removed, resected, fixed in formalin and analyzed by means of Digora digital system. The distance of the cementoenamel junction to the alveolar bone crest was measured in mm by a linear plane. The results were not significantly different between the groups and experimental periods as detected by Student's t-test ( $p > 0.05$ ). Adaptation of ligature alone was not able to traumatize the alveolar bone and play a role on the onset of periodontal disease in rats.

### Clinical, genetic and microbiological findings in a Brazilian family with aggressive periodontitis

Viana, A.C.; Kim, Y.J.; Sogingivao, P.M.; Salmon, C.R.; Pires, J.R.; Peres, R.C.R.; Scarel-Caminaga, R.M.

Aggressive periodontitis (AgP) represents an inflammatory disease of the periodontal tissues caused by infection of highly virulent bacteria in a possibly highly susceptible subject to periodontal disease. This work reports clinical, genetic and microbiological findings in 11 members of a family with AgP. After periodontal exams, DNA was obtained from epithelial cells and PCR-RFLP was used to investigate IL2, IL4 and IL10 gene polymorphisms. Microbiological samples obtained from gingival crevicular fluid were submitted to PCR in order to detect pathogenic bacteria. Six members of the family showed generalized AgP, four showed localized AgP, and only one was not affected by AgP. The genetic analysis revealed that 60% of the kindred affected by AgP showed specific IL4 (TTD) / IL10 (ATA) haplotypes combination, although it could not be statistically proven. It was found a prevalence of *Actinobacillus actinomycetemcomitans* (72.7%), followed by *Prevotella nigrescens* (54.5%), *Tannerella forsythensis* (45.5%), *Porphyromonas gingivalis* (36.3%) and *Treponema denticola* (9%). The presence of *Porphyromonas gingivalis* was correlated with clinical findings (visible plaque, bleeding on probing and probing depth,  $p = 0.03$ ). There was a predominance of AgP in this family. The presence of periodontopathogens and some haplotypes in important genes probably could contribute to this predominance.

### Investigation of -353 (A/T) IL8 gene polymorphism in individuals with chronic periodontal disease

Kim, Y.J.; Viana, A.C.; Curtis, K.M.C.; Cirelli, J.A.; Orrico, S.R.P.; Scarel-Caminaga, R.M.

Interleukin 8 (IL8) is an important chemokine that acts as a potent chemoattractant for neutrophils. It is mainly involved in the initiation and amplification of acute inflammatory reactions and chronic inflammatory processes. The ability of individuals in producing IL-8 is partially determined by -353 (A/T) IL8 gene polymorphism, as AA individuals are higher producers. The aim of the present study was to investigate the association between -353 (A/T) polymorphism in the IL8 gene and the susceptibility to chronic periodontal disease (DPC). One hundred and twelve individuals (control group = 65 and DPC group = 47) were included in this study. DNA was extracted from epithelial buccal cells. PCR-RFLP method was used to investigate the polymorphism in the promoter region of the gene. The statistical analysis of the allelic frequency was assessed by the chi-squared test while genotypic frequency was assessed by CLUMP test. Frequency data for genotypes in Brazilians were compared to those obtained from other populations using the chi-squared test. No significant differences in the allele ( $p = 0.5181$ ) and genotype ( $p = 1.0$ ) frequencies of the polymorphism were found between control and DPC group. The genotype frequency of the polymorphism observed in Brazilians was significant different to that reported in other populations ( $p = 0.0002$ ;  $p = 0.0004$ ). It was due to the lower frequency of AA individuals in our population (3%). In conclusion, -353 (A/T) polymorphism in the IL8 gene was not associated with the susceptibility to chronic periodontal disease in the Brazilian population enrolled in this study.

### The use of acid demineralization of dental and bone surfaces to improve the regenerative potential of the bone grafts in Periodontics

Rodrigues, M.G.S.; Passanezi, E.; Sant'Ana, A.C.P.; Greggi, S.L.A.; Rezende, M.L.R.

Root surfaces exposed due to periodontal pocket usually present changes in the density and composition of the mineral content, contamination by bacterial endotoxins and reduced capacity for stimulating regenerative cells. As a consequence, there is loss of the collagen fiber insertion to the root. It has been more than a century ago since the acid demineralization was first studied in the treatment of periodontally affected root surfaces with the purpose of promoting biomodifications aiming at favoring the reattachment of collagen fibers and periodontal regeneration. The acid demineralization principle is based on the exposure of growth factors (especially BMPs) present in the mineralized matrix and prevented to act by the presence of calcium. This case report illustrates how the same principle can be applied to increase the prognostic of the bone grafts in Periodontics using acid demineralization on both root and bone surfaces that will be in contact with the graft. Non smoking and healthy individuals presenting periodontal 2- and 3-wall infrabony defects were treated by osteoperiosteal flap, debridement of the defects, root scaling, root and bone demineralization by citric acid (pH=1 for 3 min), filling of the defects with particulated autogenous bone grafts covered by collagen bovine membrane and suture of the flap. The clinical and radiographic results after 2 and 3 years certify the success of the presented technique, with evidences of fulfilling of the defects and significant reduction of the probing depth. These results led to the development of studies involving the principle of the bone demineralization in other procedures on Periodontics and Implantology.

### Subepithelial connective tissue graft: case report

Sousa, T.P.T.; Silveira, E.M.V.; Nogueira, A.L.R.N.

This work reports the case of a 62-year-old patient with good systemic and periodontal health who presented generalized gingival recession caused by iatrogenic brushing and occlusal trauma. The chief complaints were regarding esthetics and dentin sensitivity. The proposed treatment was root fulfillment with glass ionomer (Vitremmer-3M) to recover the original dental anatomy and, thereafter, sub epithelial connective tissue graft surgery on teeth 13, 14 and 15. Periodontal conditions were analyzed and classified as Miller Class I and periodontal phenotype IV. Bruno technique was used on tooth 13, together with Zucchelli technique (distal of tooth 14 and distal of tooth 15), without vertical incisions. After that, conjunctive tissue was removed from a donor site, 20mm long and 1mm thick (Hartzel). The postsurgical control was performed at 7 days, 1 month and 3 months. After subepithelial connective tissue graft surgery, the involved teeth showed complete root coverage, restoring the gingival zenith.

### Evaluation of two simplified protocols for PRP preparation: predictability of platelet concentration - a study in humans

Póla, N.M.; Messoro, M.R.; Furlaneto, F.A.C.; Sbrana, M.C.; Esper, L.A.; Garcia, V.G.; Nagata, M.J.H.

PRP biologic effect depends on platelet concentration. Therefore, it is important, from a clinic point of view, that the protocol used for PRP preparation be highly predictable with respect to platelet concentration. The purpose of this study was to analyze the predictability of two simplified protocols with regard to PRP platelet concentration. 10 mL of blood were drawn from each of 10 subjects. Blood samples were divided into two groups according to the protocol used for PRP preparation: Group I (one centrifugation) and Group II (double centrifugation). The platelets in the whole blood and PRP samples from each person were counted automatically. Data were submitted to statistical analysis. The normality of the data was confirmed and the t test was used ( $p < 0.05$ ). Pearson's correlation coefficient was used to demonstrate the relationship between the platelet counts from the PRP and the whole blood samples. The mean whole blood platelet count was  $252,000 \pm 68,330$ . PRP samples from Group II presented a percentage increase in platelet count significantly greater than that of the samples from Group I ( $524.29\% \pm 206.67$  and  $155.53\% \pm 27.05$ , respectively). A statistically significant correlation between the platelet count from the whole blood and PRP ( $r = 0.85$ ) was only observed in Group I. Group II presented a low correlation coefficient ( $r = 0.08$ ) and a greater variability with regards to platelet concentration. Within the limits of this study, it may be concluded that only Group II presented an appropriate platelet concentration for clinical application, although with low predictability.

**Low molecular weight chitosan gel in critical-size bone defects in rat calvaria: a radiographic evaluation**

Neto, R.S.; Pavone, C.; Filho, S.P.C.; Cardoso, M.B.; Junior, E.M.

The search for biomaterials that are able to improve tissue regeneration increased the interest in studies with natural polymers, such as chitosan, a biopolymer obtained from Chitin that shows potential in bone formation. The present study conducted a radiographic evaluation of critical-size bone defects prepared in rat calvaria filled with a low-molecular weight chitosan gel (100,000 kDa) and covered with a collagen scaffold. For that, bone defects with a 8 mm diameter were made in 20 Holtzman rat calvaria, and the animals were divided in four groups, according to the filling biomaterial and the period of evaluation: blood clot (15 and 60 days) and low-molecular weight chitosan gel (15 and 60 days). Digital standardized radiographs of animals' skulls were taken right after the surgery and after the established evaluation periods. Radiographic density in a 1000 pixels area in the center of the filled defects were evaluated and compared by ANOVA test ( $p < 0.05$ ). The results showed that at the initial period (15 days), only the blood clot group had a significant bone radiographic density increase, while at the final period (60 days), both blood clot and chitosan gel groups had similar result. It may be concluded that the tested biomaterial showed a positive influence over long-term regeneration of bone defects, although the perceived variations in the blood clot groups suggest that further studies are needed to indicate the use of chitosan gel as a biomaterial under clinical conditions.

**Treatment of Miller Class III, Nordland and Tarnoo Class II recession in a maxillary left central incisor using orthodontic extrusion and fixed single-tooth denture**

Zingra, A.C.G.; Nunes, L.F.P.; Nunes, M.P.; Mello, L.G.N.; Nunes, D.A.P.; Nunes, I.S.; Filho, D.P.N.

The orthodontic extrusion of teeth or the forced eruption may be proposed to diminish intra-osseous imperfections of an isolated tooth. The purpose of this work is to describe a case report in which the slow orthodontic extrusion technique was performed on the maxillary left central incisor in order to treat the Miller Class III recession. A 51-year-old female patient presenting with Miller Class III recession on the tooth 21 sought for dental care. The proposed treatment was the slow orthodontic extrusion of tooth 21, followed by rehabilitation with fixed single-tooth denture. Orthodontic brackets were installed on the maxillary anterior teeth, in order to move the crown of tooth 21. Every 3 weeks, the orthodontic elastics were activated and the incisal edge of tooth 21 was adjusted to avoid occlusal interferences. Radiographic control was undertaken in order to standardize the radiographic data during the forced eruption period, which extended for four additional months of retention until the stabilization of the tooth in its correct position. The anatomy was reestablished by composite resin immediately after removal of the provisional prosthetic crown. In conclusion, the slow orthodontic extrusion technique was effective in treating Miller Class III recession.

**Ethetic-functional clinical crown lengthening**

Assaoka, A.M.F.; Nunes, L.F.P.; Filho, D.P.N.; Mello, L.G.N.; Nunes, I.S.; Nunes, M.P.

Most dental procedures are undertaken with the goal of reaching satisfactory esthetic outcomes. For such purpose, it is necessary to plan the treatment. The shape and position of the lips during speech and smile cannot be easily changed. However, the dentofacial esthetics can be improved by means of a combination of the periodontal and prosthetic procedures. In this case, the lip shape, the localization of the smile line, as well as the probing depth, insertion levels, bone height, restorations and caries lesions were evaluated. The purpose of this work is to report case of crown lengthening in maxillary anterior and posterior areas and prosthetic reestablishment. A 48-year-old patient presented with short prosthetic crowns. At the initial clinical examination, the clinical crowns of the maxillary central incisors were exposed all over their extension. Firstly, the probing depth of the gingival sulci was determined. Next, the alveolar bone level in relation to the free marginal gingiva was determined. After the primary incision, a secondary intrasulcular incision was made and the gingival collars were removed. The bone crest was exposed by full-thickness flap elevation and was reduced in height. After tissue maturation, individual metal-free crowns were prepared for each anterior tooth. Based on the outcomes of this case, it may be concluded that the performed technique is satisfactory if correctly planned and indicated, providing a harmony smile and recovering the lost dentofacial esthetics.

**Miller Class I recession recovery**

Kurokawa, L.A.; Nunes, M.P.; Filho, D.P.N.; Mello, L.G.N.; Nunes, I.S.; Nunes, L.F.P.

Gingival recession can be defined as the exposure of the root surface caused by the apical migration of the marginal gingiva. Dentin hypersensitivity, root cavity and esthetic problems may coexist with exposed roots. The purpose of this work is to report a case in which the Raetzke technique or the envelope technique was used in order to treat a gingival recession. A 37-year-old female patient presented with Miller Class I recession in tooth 14 associated with intense dentin hypersensitivity. Thus, root coverage by the envelope technique was preferred. The treatment of the exposed root area was performed by the application of tetracycline solution, during three minutes. Then, the sulcular incision and insertion of the blade in the mesial and distal directions was made. After preparation of the recipient area, a graft from the palate was obtained. The graft was adapted and stabilized in the recipient site. The immediate postsurgical control was performed the 7th postoperative day. Another follow up visit was undertaken 3 months later. During this period, total root coverage and absence of dentin hypersensitivity were observed. It may be concluded that, under the conditions of the present case, the Raetzke or envelope technique was effective in the treatment of Miller Class I recession.

**IL-10-592 polymorphism influences TIMPs and OPG expression**

Silva, M.C.; Assis, G.F.; Júnior, W.M.; Trevilatto, P.C.; Silva, J.S.; Cardoso, C.R.B.; Garlet, G.P.

Periodontal diseases are infectious diseases in which periodontopathogens trigger chronic inflammatory and immune responses. Inflammatory mediators, such as TNF- $\alpha$  and IL-1, trigger tissue destruction by production of proteases that degrade the extracellular matrix, mainly matrix metalloproteinases and activation of bone resorption mechanisms. Antiinflammatory cytokines, such IL-10, are thought to attenuate periodontal tissue destruction by the induction of tissue inhibitors of metalloproteinases (TIMPs) and osteoprotegerin (OPG). However, a high individual variation in the levels of IL-10 mRNA is verified, and is possibly influenced by genetic polymorphisms, known as modulators of IL-10 expression. In this study, IL-10 promoter 592 SNPs was analyzed by RFLP (restriction fragment length polymorphism), and the tissue levels of IL-10, TIMPs and OPG were determined by RealTime-PCR in chronic periodontitis (CP) patients and control (C) subjects. As result, A allele of IL-10 promoter -592 polymorphism was associated with lower tissue levels of IL-10, TIMP-1 and OPG expression, and was also associated with higher mean probing depth values in CP patients. In conclusion, IL-10 promoter gene 592 C/A / [ATA] genotype seems to be functional in chronic periodontitis, which supports their inclusion as one of the candidate markers of periodontitis risk.

**Use of absorbent membrane as a drug-release device for adequacy prior to root coverage**

Cherulli, T.L.; Menezes, H.H.; Naves, M.M.; Menezes, M.M.; Magalhães, D.

Oral adequacy prior to periodontal surgical procedures is still one of the indispensable requirements to this therapy. Traditionally obtained with mechanical procedures, it has currently found on the local application of antibacterial agents a complementary alternative to scaling and root planing, mainly in cases of probing depth above 5mm. However, to increase the effectiveness of these agents, it is necessary to associate a vehicle capable of keeping the agents and releasing them into the periodontal pocket within a certain time. Amongst the possible options, the absorbent vehicles stand out because they are usually applied only one time and do not require further removal. The present work used a drug-release device made from xenogenous absorbent membranes (Genderm-Baumer), to which tetracycline was incorporated. Initially, tooth 23 presenting a probing depth of 7mm in the buccal surface, was submitted to scaling and root planing. After 15 days, it was observed a reduction of 2mm of the periodontal pocket depth and the device was put into the periodontal pocket. Fifteen days after application, there was 3mm of probing depth. After these procedures, root coverage was performed by means of periodontal plastic surgery (coronal slip).

**Periodontal plastic surgery for gingival zenith reconstruction**

Oliveira, L.C.G.; Domingues, R.S.; Pavan, L.M.; Sant'Ana, A.C.P.; Gregghi, S.L.A.; Passanezi, E.; Rezende, M.L.R.

The main goal of the periodontal surgery is to reestablish health, by reducing probing depth and promoting maintenance of the dentition. However, there has been a great increase in the search for surgical therapy essentially due to cosmetic purposes. Gingival recessions, not only represents a morphologic abnormality with functional consequences, but also causes an esthetic impairment. This condition often alters

the gingival zenith, which determines the regular concave arc, and causes an imbalance on the contour of the tissues, consequently affecting the patient's smile. The currently available surgical techniques for root coverage have low predictability. Among these, the semi-lunar flap, described in 1986 by Tarnow, stands out and is especially indicated for single recessions. This work reports a case of modification of the semi-lunar technique, used to cover contiguous recessions in the upper incisors of a female adult patient. The union of two semi-lunar flaps formed an "m" letter and the coronal sliding of these flaps reestablished the gingival zenith. Details about the surgical technique as well as the local aspects that can interfere with the results, such as type of recession and quality of the gingival tissues, are presented. Even though the semi-lunar flap was created and recommended for single recessions, the proposed modification can reach esthetic results on the coverage of contiguous recessions.

#### Evaluation of a new system to prepare platelet-rich plasma (PRP): a study in rabbits

Campos, N.; Melo, L.G.N.; Messora, M.R.; Furlaneto, F.A.C.; Póla, N.M.; Bosco, A.F.; Nagata, M.J.H.

The therapeutic use of platelet growth factors to accelerate bone regeneration requires suitable methods of PRP preparation. The purpose of this study was to analyze the efficiency of a new automated system to prepare PRP. 16 white adult male New Zealand rabbits, weighing approximately 3.5 kg, were used. 35 mL of blood was drawn from each animal via cardiac puncture. PCCS IITM (3i Implant Innovations, Palm Beach Gardens, FL, USA) was used to prepare the PRP. The platelets in the whole blood and PRP samples from each animal were counted manually. Data were submitted to statistical analysis. The normality of the data was confirmed and the t test was applied ( $p < 0.05$ ). Pearson's correlation coefficient was used to demonstrate the relationship between the platelet counts from the PRP and the whole blood samples. The mean platelet count in the whole blood and PRP of the animals was  $351,111.60 \pm 44,187.71$  and  $1,087,813 \pm 277,125$ , respectively. The mean percent increase in PRP platelet count in relation to whole blood was  $407.30 \pm 161.83\%$ . A statistically significant correlation was observed between the platelet count from the whole blood and PRP ( $r = 0.66$ ;  $p = 0.0021$ ). Within the limits of this study, it may be concluded that the PCCS IITM provided an appropriate and predictable platelet concentration in PRP.

#### Gingival melanin pigmentation: different treatment modalities for smile's esthetic propose

Neto, A.R.L.P.; Passanezi, E.; Sant'Ana, A.C.P.; Rezende, M.L.R.; Gregghi, S.L.A.

A smile expresses a feeling of joy, success, sensuality, affection and courtesy, and reveals self confidence and kindness. The harmony of the smile is determined not only by the shape, the position and the color of the teeth, but also by the coloration, texture and form of the gingival tissues. Gingival health and appearance are essential components of an attractive smile. Gingival pigmentation results from melanin granules, which are produced by melanoblasts. The normal aspect of gingival tissues is a pale pink, but part of the population has a gingival melanin pigmentation caused by melanoblastic activity in the basal epithelial layer. A close relationship between gingival pigmentation and ethnic groups is observed. Although gingival melanin pigmentation is completely benign and does not present a medical problem, complaints of "black gingiva" are common particularly in patients with a very high smile line (gingival smile). Different treatment modalities have been proposed for gingival depigmentation, including bur abrasion, scraping, electrosurgery and laser. However, in some black people who present generalized gingival melanin pigmentation, these depigmentation techniques are not the gold standard treatment because the results obtained with these technique are not stable (repigmentation process occurs within few years) and will produce a very anesthetic contrast between the periodontal tissue and patient's skin. This is a report of two cases in which the esthetic aspects were observed to make the choice for the best treatment modality for gingival melanin pigmentation.

#### In vivo evaluation of two platelet-rich plasma (PRP) activators. A study in rats

Sbrana, M.C.; Messora, M.R.; Furlaneto, F.A.C.; Deliberador, T.M.; Esper, L.A.; Garcia, V.G.; Nagata, M.J.H.

Platelet-rich plasma (PRP) enhances wound healing by degranulating platelets á granules that contain growth factors. *In vitro* studies have shown that the bioavailability of these growth factors in the wound site depends on the type of activator used to initiate PRP clot formation, which may affect its biologic effect *in vivo*. The purpose of this study was to evaluate histologically the influence of the PRP activated with either calcium chloride solution or thromboplastin on bone healing in critical-size defects (CSD) in rat calvaria. 48 rats were divided into 3 groups: C, PRP-C and PRP-T. An 8 mm in diameter CSD was made in the calvaria of each animal. In Group C (control), the defect was filled with a blood clot only. In

Groups PRP-C and PRP-T, the defect was filled with PRP activated with calcium chloride solution and thromboplastin, respectively. Each group was sub-divided into two sub-groups for euthanasia at either 4 or 12 postoperative weeks. Histologic and histometric analyses were performed. New bone formation was quantified as a percentage of the total area of the original defect. Data were submitted to statistical analysis (ANOVA, Tukey's test;  $p < 0.05$ ). No defect was completely regenerated with bone. Group PRP-C presented significantly more bone formation than Groups C and PRP-T, both at 4 and 12 postoperative weeks. No statistically significant differences were found between Groups PRP-T and C at both periods of analysis. Within the limits of this study, it may be concluded that the activator used to initiate PRP clot formation can influence its biologic effect in bone healing in rat calvaria.

#### in vitro evaluation of two Platelet-Rich Plasma (PRP) activators. A study in rats

Esper, L.A.; Messora, M.R.; Sbrana, M.C.; Furlaneto, F.A.C.; Campos, N.; Bosco, A.F.; Nagata, M.J.H.

The activator used to clot the PRP may modify its biologic effect. A greater clot retraction may decrease the bioavailability of the growth factors released from the platelets. The purpose of this study was to evaluate the influence of two activators on PRP clot formation. 10 male adult rats were used. 4 mL of blood was drawn from each animal via cardiac puncture. PRP was prepared by a double centrifugation protocol. Two blood samples of 0.2 mL from each animal were used in the clot retraction tests. They were divided into two groups according to the activator used to clot the PRP: Group CC (0.01 mL of calcium chloride solution) and Group TP (0.4 mL of thromboplastin). Standardized photographs were taken at 0, 1 and 24 hours. Furthermore, at 24 hours, the supernatant released from each PRP sample was harvested and quantified (in milliliters). The photographs were digitalized and the clot retraction was determined by measuring its area using the software "ImageLab 2000". Data were submitted to statistical analysis (ANOVA, Tukey's test, t test;  $p < 0.05$ ). Samples from Group TP presented a statistically significant greater amount of supernatant than those from Group CC at 1 and 24 hours ( $0.37 \text{ mL} \pm 0.09$  and  $0.04 \text{ mL} \pm 0.01$ , respectively). Groups CC and TP presented a significant clot retraction, when compared to the initial time (0 hour). Group TP ( $46.85\% \pm 8.0$ ) presented significantly greater clot retraction when compared to Group CC ( $29.88\% \pm 5.38$ ) at 24 hours. It may be concluded that thromboplastin promoted greater PRP clot retraction than calcium chloride solution, which may impair PRP biologic properties.

#### The importance of the bone plate thickness and buccal soft tissue in obtaining esthetics in implants

Moraes, A.F.; Rezende, M.L.R.; Passanezi, E.; Sant'Ana, A.C.P.

Amongst the prerequisites to allow the installation of osseointegrated implants, the alveolar ridge anatomy (both its height and thickness) is clearly essential to treatment success and several techniques have been developed with the goal of improving its conditions (block bone graft, particulate bone graft, etc). Ideally, it is desirable to have an alveolar ridge with sufficient height to accommodate the implant with proper length and reestablish the functional requirements of the area. In addition, implant diameter can improve the area of osseointegration, thus enhancing the support capacity. However, although the alveolar ridge thickness is a key factor to accommodate implants with both larger and smaller diameters, the importance of having an appropriate bone plate should not be overlooked in order to prevent losses on the top of alveolar ridge after the installation of the prosthetic crown. Knowing that a semi-lunar marginal loss usually occurs around implants in function and that this loss does not decrease the alveolar ridge height, it is necessary to have at least 2 mm of bone plate thickness. This is complicated in areas with great esthetic requirements because, when this limit is not respected, there is exposure of a larger extension of the crown, compromising the rehabilitation. Another aspect associated with this situation is the thickness of the gingival tissue. Given that implant diameter is usually smaller than that of natural teeth, it is necessary to check the emergence profile before installation of the prosthetic crown in order to fit the crown dimensions to implant dimensions. Gingival conditioning is undertaken by means of gingival tissue compression by the placement of a provisional crown. This process might lead to loss of gingival tissue height, if its thickness is not appropriate, also creating prosthetic crowns larger than the adjacent teeth, which will compromise the final esthetic outcome.

#### Gingival recession: case report

Ferranti, C.S.; Silveira, E.M.V.; Chihara, S.G.; Pinto, C.O.; Nogueira, A.L.R.N.

This work reports the case of a 36-year-old male patient with good systemic and periodontal health, who presented with generalized gingival recessions that had as predisposing factors occlusal trauma and iatrogenic toothbrushing. His main complaints were esthetics and dentin sensitivity. In accordance with the settled treatment plan, subepithelial connective tissue grafts were performed in the region

of teeth 32, 33 and 34, and a glass ionomer restoration was placed on tooth 33, in order to reestablish the dental anatomy original of this region. The periodontal conditions were recorded by means of measurements of gingival bleed index, plaque index, probing depth and level of clinical insertion. The patient presented a 3-mm recession in the buccal surface of tooth 32, 4-mm recession in the buccal surface of tooth 33, and 2-mm recession in the buccal surface of tooth 34, classified as Miller Class I and periodontal phenotype IV. Based on the periodontal plastic surgery criteria, a modified Bruno technique was used, with coronal flap elevation without vertical incisions. An approximately 10-mm long and 1-mm thick graft was removed from the donor site and positioned at the cemento-enamel junction of the recipient area, and stabilized with interpapillary sutures, using vycril 6.0 sutures. The postsurgical control was performed at 7 days, 1 month and 3 months. After subepithelial connective tissue graft surgery, there was satisfactory reestablishment of the zenith in the areas with gingival recession.

#### **Resources in Implantology in the presence of inadequate bone ridge: insufficient height and/or thickness**

Pinto, C.O.; Rezende, M.L.R.; Sant'Ana, A.C.P.; Passanezi, E.; Greggi, S.L.A.

During the examination and planning for implant placement, many aspects must be considered, but two aspects must be primarily observed: bone height and thickness bone. These anatomic aspects are important to allow implant placement in the best position to permit further denture placement in a satisfactory esthetic and functional condition. It is frequent to find deficient bone ridge in height and/or thickness, which demands treatments alternatives that can return the anatomic requirements of the bone ridge. There are several therapeutic possibilities to this aim, among which stand out: block bone graft prior to implant surgery, particulated bone graft prior to or concomitantly with the implant surgery, guided bone regeneration prior to or concomitantly with the implant surgery using conventional membrane or membrane with titanium, maxillary sinus floor augmentation, etc. Such therapeutic options must be acknowledged by the dentist in order to apply these alternatives when it is necessary, in such a way that implant placement can occur in the best position, length and diameter for a good prognosis.

#### **Esthetic planning of the smile. A multidisciplinary approach**

Baldo, T.O.; Baldo, V.M.O.; Tavares, S.P.R.; Júnior, R.P.

This work reports a case of a 21-year-old patient who presented with agenesis of teeth 12 and 22 and had teeth 13 and 23 repositioned orthodontically in order to occupy the space of the missing lateral incisors. The treatment plan involved a multidisciplinary group of professionals. After orthodontics, occlusal adjustment was made using a semi adjustable articulator and functional waxing, periodontal plastic surgery from teeth 15 to 25, whitening and direct adhesive dentistry were performed. A multidisciplinary approach was used to achieve consistent functional results and excellent smile esthetics.

#### **Tobacco smoking: critical aspects on surgical therapy in Periodontology and Implantology**

Cândido, C.R.; Rezende, M.L.R.; Sant'Ana, A.C.P.; Passanezi, E.; Greggi, S.L.A.

Nowadays, it is widely accepted that tobacco smoking is a serious public health problem, showing effects all over the organism, acting as a risk factor for a number of pathologies. In dentistry, periodontal disease is the pathology in which the toxic effect of tobacco smoking can be most easily seen. The substances containing in tobacco smoke can start the periodontal disease and aggravate it. The current literature has several studies addressing different aspects of the negative effect of the tobacco on the periodontal structures, severity of periodontal disease, tooth loss, local and systemic effects, etc. Another important problem of tobacco smoking is the bad results seen after periodontal surgery and implants. Many factors can be related to these effects, such as less blood supply to the wound areas because of the vasoconstriction, compromising the healing; negative effects on the phagocytosis capacity and chemotaxis of polymorphonuclear leukocytes as well as decrease of functional activity of macrophages and monocytes; alteration of the inflammatory mediators; more predisposition to the colonization by more aggressive pathogens; inhibition of proliferation and insertion of fibroblasts to root surface as well as decrease of its synthesis capacity. All these factors have negative aspects on Implantology as well. The literature clearly demonstrates that failures are far more common in tobacco smokers, affecting the osseointegration or causing posterior bone loss.

#### **Investigation on the time required for biological distance reestablishment after surgical clinical crown lengthening aiming at the "earliest possible" prosthetic re-preparation**

Adachi, A.; Gonzalez, M.K.S.; Rezende, M.L.R.; Sant'Ana, A.C.P.; Passanezi, E.; Greggi, S.L.A.

A longitudinal evaluation was carried out after surgical clinical crown lengthening taking into consideration multiple clinical aspects during wound healing. 23 patients were enrolled in this study, with a total of 30 premolars submitted to the surgical procedure. Diverse clinical parameters were recorded in the preoperative period, immediately postsurgical period and 1, 2, 3, 4, 5, 6 and 12 months postoperatively, generating diverse works. The following aspects were evaluated: gingival margin level, relative insertion level, mucogingival junction, bone level, cervical ending of the existing prosthetic preparation, probing depth, amount of keratinized mucosa, gingival margin migration, bone resection, supraosseous gingival tissue, among others. An occlusal guide was used with referential fixture and the measures were taken with aid of an endodontic stopper and gauged with a centesimal digital pachymeter. During the study, the patients were maintained under plaque control, as determined by measuring plaque and gingival bleed indexes at all periods. The results showed that there was no gingival margin stability during the course of the study, demonstrating that the process of formation of the biological distances is not fast and is of difficult precise definition. Aiming at the "earliest possible" prosthetic re-preparation, it may be concluded that re-preparation can be performed within 4 months, provided 0.5 mm subgingival in the buccal and lingual surfaces, but leaving the preparation at the gingival margin level in the proximal surfaces due to the coronal migration of papillae up to 12 months.

#### **Periodontal planning for root coverage in individual with cleft lip and palate: case report**

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Careful periodontal planning allows good outcomes and is fundamental for the esthetic and functional success. This work reports the case of a patient with indication for reduction of tissue thickness at the palatal surface of maxillary teeth and connective tissue graft at the region of the left maxillary canine. After proper planning of the case, grafting was performed with connective tissue obtained from internal gingivectomy, avoiding the need of a second surgery.

#### **Periodontal profile of patients with diabetes mellitus**

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Factors such as duration of diabetes, poor glycemic control and presence of complications are important in the evaluation of patients with diabetes and may have relation with the increase in the incidence of periodontitis in these patients. The aim of this study was to present a profile of the periodontal conditions of a group of patients with diabetes mellitus. Eighty-one individuals were evaluated and personal and relative data were raised about diabetes such as: type, duration of disease, metabolic control level (HbA) and presence of complications. Periodontal exam consisted of: evaluation of probing depth, clinical attachment level, visible plaque level and marginal bleeding index. For periodontal diagnosis, the following categories were considered: gingivitis, localized chronic periodontitis (L.C.P.), generalized chronic periodontitis (G.C.P.) (AAP, 1999). Data were entered and analyzed by Epi Info 6.04b software and the results were obtained by simple percent analysis. It was observed that 54.3% of the total sample were women, 69.2% of the individuals had type 2 diabetes and were aged 45 years or older. Among patients with type 2 diabetes, 50% presented L.C.P. and 35.7% presented G.C.P. Sixty-two percent of the better-controlled diabetes individuals (HbA <8) had L.C.P., while in the group of poor-controlled patients there was a greater trend to G.C.P. Thirty-six percent of the total sample exhibited no complications, but had periodontal disease, while 51.9% presented some periodontal complication, from which 54.8% had L.C.P. In relation to oral hygiene condition, 64.2% of the individuals presented unsatisfactory hygiene from which 57.7% had L.C.P. and 42.3% had G.C.P. It may be concluded that great part of the studied population had chronic periodontitis and, therefore, patient with diabetes must be evaluated and treated periodontally. In these patients, periodontal disease may have a relation with age, metabolic control, presence of complications and bacterial plaque.

### Analysis of the biocompatibility and time of absorption of swine collagen membranes in surgical procedures

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The application of physical barriers for regeneration of bone defects was first proposed by Dahlin et al. (1988), who reported a technique known as guided bone regeneration (GBR). Currently, the principles of GBR have been used in the repair of bone defects; bone volume increase of resorbed alveolar ridges; development of bone areas for dental implants; associated or not with grafting procedures for post-extraction treatment of dental sockets for immediate implantation; treatment of periimplant fenestrations and dehiscence defects; and treatment of periimplantitis. In this way, GBR has been successfully used to treat some types of bone defects. Problems associated with the procedure, such as premature exposure of the membranes to oral cavity and the consequent contamination. The material of the swine membrane is a bone tissue matrix from the femur of pigs. Swines, including the mini-pigs, present similarities with humans with respect to dental aspects, relative to their morphology, physiology and biocompatibility. The purpose of this work was to provide information on the applicability, biocompatibility and time of absorption by the human organism of swine collagen membrane in regenerative periodontal procedures.

## Oral Rehabilitation

### Bond strength of denture teeth to acrylic resins after microwave irradiation

Moffa, E.B.; Ribeiro, R.C.; Vergani, C.E.; Pavarina, A.C.; Izumida, F.E.; Giampaolo, E.T.

One of the most usual types of failure in a denture is bond failure between a denture tooth and an acrylic resin denture base. Thus, this study evaluated the bond strength of denture teeth (Vivadent-DV and Biotone-DB; central incisors) to acrylic resins (QC20-QC, Acron MC-AC and Lucitone 550-L) after microwave irradiation. A total of 240 specimens were fabricated, 120 from each brand of denture tooth. All specimens were randomly divided into 4 groups (n=10): G1 (control group) – immersed in distilled water at 37°C for 48 h, G2 – immersed in distilled water at 37°C for 48 h and microwaved twice at 650W for 6 min, G3 – immersed in distilled water at 37°C for 48 h and microwaved daily for 7 days, G4 – immersed in distilled water at 37°C for 8 days. Shear load was applied with a load testing machine at 45 degrees from the long axis of each denture tooth on the palatal surface at a crosshead speed of 0.5mm/min until fracture. Student's test (p=0.05) was applied to data for the detection of significant differences between two brands of denture teeth. Most of bond strength values established between DB and the resins were significantly higher than those of DV, except for G1 and G2. For G1, the strength of QC bonded to DV was significantly higher (P<0.05) than QC bonded to DB. No significant differences were observed with both brands of teeth when bonded to AC resin for G1 or bonded to L resin for G1 and G2. However, the variation (%) of bond strength was predominantly lower with DB than DV. In conclusion, DB may be indicated with reliability due to its uniform behavior.

### Misalignment of implant-supported prosthesis in relation to dental arch: 12 years of follow-up

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The purpose of this study was to warn the dental community about a possible problem in partial implant-supported prosthesis for long periods in function. The misalignment between natural teeth and implant-supported prosthesis on teeth 11 and 12, observed in a 12-year clinical follow-up, illustrates the fact. Two Nobel Biocare® implants were placed and left covered for 6 months. The second-stage surgery was performed and the provisional denture was readapted. After 11 days, the abutments were installed and the fabrication of the prosthesis started. The definitive metal-ceramic crowns were placed in 2005, after a rigorous occlusal adjustment. Evaluations were made at 2, 4, 6, 9 and 12 years, when it could be noticed that the restorations were positioned palatally and with an extrusion in comparison to the natural teeth. The implants presented a natural bone loss to the system utilized. However, after 9 years, a greater discrepancy could be noticed, with anterior occlusion and esthetic changes. The possible causes have been discussed: occlusal problems, parafunctional habits and natural movement – strength anterior component. The two first options were discarded after clinical analysis and diagnosis. Therefore, the natural movement, probably deriving from an interaction of mechanical and genetic factors might have been the cause. However, further investigation is needed. The implants do not have periodontal ligaments, but rather an ankylosis, so they do not suffer those movements. This case emphasizes the need to inform the patients that the implants can last more than 10 years in function, but it is not the same with the restorations, when losing function and esthetic, must be replaced, giving back harmony to the stomatognathic system.

### Effect of thermocycling on the impact strength of one denture base and two relined acrylic resins

Bochio, B.C.; Lazarin, A.A.; Perez, L.E.C.; Vergani, C.E.; Pavarina, A.C.; Wady, A.F.; Machado, A.L.

Adequate impact strength is essential for relined dentures to resist the forces of mastication, thus preventing denture fracture. Clinically, the denture base materials are submitted to temperature changes during the intake of hot and cold food and drinks or the cleansing regimens. This study evaluated the effect of thermocycling on the impact strength of one heat-polymerizing resin (Lucitone 550 -L) when relined using the same material or the autopolymerizing relined resins Ufi-Gel Hard (U) and Tokuyama Rebase II (T). The impact strength of intact resin L specimens, before and after thermocycling, was also evaluated. Specimens of L (n=30) were made (60 mm × 6 mm × 2 mm) and relined (2 mm) using the same material (L/L) or the relining resins T (L/T) and U (L/U). Intact L specimens (n=10) were also made (60 mm × 6 mm × 4 mm). The specimens were then divided into 2 groups: G1 (control – without thermocycling); G2 - specimens were thermally cycled for 5.000 cycles between 5±2°C and 55±2°C. A 0.8mm V-notch was prepared and the specimens were submitted to the impact test (Charpy) using a 0.5 J Charpy pendulum and distance of 50mm between the supports. Data (kJ/m<sup>2</sup>) were analyzed by Kruskal-Wallis test (á=0.01). For both groups, resin L (G1- 1.65; G2- 1.53) exhibited a significant increase in the mean impact strength after relining with T (G1-5.90; G2-4.71), a decrease after relining with U (G1-0.67; G2-0.68), and remained unaffected after relining with L (G1-1.71; G2-1.54). Only L/L combination (1.71) showed a decrease after thermocycling (1.54). Thermocycling had no deleterious effect on the impact strength of the specimens relined with materials T and U, but promoted a decrease when relining was made with resin L. The highest impact strength was observed for L/T combination.

### Impact strength of a heat-polymerizing denture base acrylic resin and two autopolymerizing relined resins

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As denture wearers become older and lose much of their supporting alveolar bone, the need for continuing prosthodontic care such as relines is more evident than previously. The relining procedure may affect the impact strength of the denture base and lead to the fracture of the removable prosthesis. This study evaluated the impact strength of one heat-polymerizing denture base resin (Lucitone 550-L) and two autopolymerizing relined resins (Tokuyama Rebase-T and Ufi Gel Hard -U). The impact strength of specimens of resin L relined with the same material and with the autopolymerizing relining resins was also evaluated. Specimens of L (n=18) were made (60 mm × 6 mm × 2 mm) and relined (2 mm) with the same material (L/L) or with the relining resins T (L/T) and U (L/U). In addition, intact L, T and U specimens (n=6) were made (60 mm × 6 mm × 4 mm). All specimens were prepared according to the manufacturers' instructions, and a V-notch was then cut to a depth of 0.8 mm. The impact test (Charpy) was carried out with a pendulum rated at 0.5 J and distance of 50 mm between supports. Data (kJ/m<sup>2</sup>) were analyzed by Kruskal-Wallis test (á=0.01), which indicated that the mean impact strength of resin L (1.72) was higher than that of resin U (0.86), which in turn was higher than that of material T (0.69). There was no significant difference between L (1.72) and L/L combination (1.72). Compared to the intact resin L, the mean impact strength was significantly increased after relining with T (L/T-6.45), whereas relining with U significantly decreased the mean impact strength (L/U – 0.67). The impact strength of resin L remained unaffected after relining with the same material, and was significantly increased after relining with resin T.

### Evaluation of phonetics in prosthodontic patients

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Dental procedures must respect esthetics, phonetics, masticatory and deglutition functions, oral functions and the neuromuscular system. The purpose of the present study was to make a literature review of the most important aspects of speech related to dental prostheses. Furthermore, a speech conference list was proposed to be used during dental treatment. Speech is the most complicated response of men, but it is frequently underestimated because its complexity is not apparent. Speech rehabilitation can be done by the reshaping of teeth and palate of the dental prosthesis, reestablishment of the vertical dimension, free functional space and closest speaking space. The sounds are described by the way they are produced and by the articulators they involve. They can be classified as: plosive, fricative, nasal, liquid, affricative, basal and vibrating. For dental procedures, during denture adjustment, the most important sound is /s/. The correct production of speech might be altered when there is anterior open bite, mispositioned teeth position, tooth loss, inadequate tooth shape and anatomy, alteration in vertical dimension, in free functional space and closest speaking space, discrepancy between overjet and overbite. The two most common speech errors are lisping and whistling. They are characterized as escape of air with substitution of certain sounds and whistle, respectively. All dentists must