

Poster Presentation

P01

Dentine Hypersensitivity Treatment With Laser. A Clinical Report.

Almeida, E.C.A.; Barbosa, R.G. ; Menezes, M.R.A..

The present work aim to demonstrate, through the description of a case report, an.

Effectivity of the therapy by laser when its realized in hypersensitivity dentine. An application of gallium aluminium arsenide laser was done after a periodontal therapy . The hypersensitivity dentine level was evaluated using mechanic stimulus with an explorer probe, with air and cold water. Two applications by laser were realized, being evaluate, with an air jet, the pain level before and after the applications. It is clear that had an enhanced reduced of the sensibility after each application. This result shows that the low density power laser can be used like an efficient therapeutics form in hypersensitivity dentine treatment.

P02

Effect of the Phototherapy in the Healing Process of Wounds in Malnourished Animals. Comparative Study .

Almeida, D. ; Meireles, G.; Ramalho, L.; Vieira, A.; Levi, T.; Pinheiro, A. L. B.

Doutoranda em Laser - UFPB/UFBA

The purpose of this study was to analyse, under light microscopy, the effect of the diet; the laser therapy and the phototherapy in the repair process of surgical wounds. For this, 25 Wistar rats were divided into five groups and a standardized excisional wound was created on their backs. The animals were sacrificed on the eighth day after the surgery and specimens were removed and analyzed in accordance with the following parameters: epithelial pavement; inflammation; fibroblastic proliferation; organization and maturation of the collagenous fibers. Conclusion: The nutritional factor intervened in the repair process and phototherapy showed positive biomodulation in the healing process of the wounds, being this, more evident in the malnourished animals.

P03

Effect of photodynamic therapy on the development of ligatures induced periodontitis in rats.

Almeida, J.M.; Theodoro, L. H.; Bosco, A.F.; Nagata, M.J.H.; Garcia, V.G.

The purpose of this study was to evaluate the effect of Photodynamic Therapy on the progression of alveolar bone loss in an experimental periodontitis in rats. One hundred twenty (120) Wistar rats were separated into 4 groups. Cotton ligatures were placed at the gingival margin level of lower left first molars. Group 1- (control); Group 2 - Toluidine-O blue topical application (100 ug/ml); Group 3- Low Level Laser Therapy (LLLT); Group 4 - Toluidine-O blue topical application and LLLT. The laser used in this study was the 685nm GaAlAs laser (50 mW, 120 s, 4.5 J/cm²). Standardized digital radiographs were taken after sacrifice at 5, 15 and 30 days to measure the amount of bone loss around the mesial root surface of the first molar in each groups by computerized imaging system. The statistical analysis (ANOVA) indicated which groups treated had a significantly less bone loss compared to controls (p<0.001) and had not a significantly difference among treated groups. These data provide evidence that photodynamic therapy and LLLT can modify the progression of experimentally induced periodontitis in rats.

P04

Low-intensity laser treatment affects wound healing in rats.

Monte Alto, R.V.; Guimarães, J.G.A.; Silva, E.M.; Fellows. C.E.; Figueiredo, L.B.; Costa, A.M.A.

Membro do Núcleo de Aplicação do Laser em Odontologia. Wound healing is a complex process, and some studies have suggested that low level lasers may accelerate this process. The purpose of this study was to determine the effects of low-intensity laser treatment (<100 mW) on cutaneous wound healing in rats. Adult male rats were used; under anesthesia three lesions (1 cm²) were performed in the back of each animal. The first laser irradiation was done soon after lesion creation, and two additional irradiations were performed in the next two days. The superior wound was a control (no treatment), the middle wound was irradiated with 830 nm (30mW) diode laser, and the inferior wound with 685 nm (70mW) diode laser, with time exposures leading 2J total radiated energy for both, over all wounded surface. Laser

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treatment did not affect wound contraction, but accelerated re-epithelialization ($p=0,0007$, 14 days after lesion for both laser treatments). Thirty-five days after lesion the animals were euthanased and skin samples were collected for analysis. The analysis of collagen arrangement showed that lesions treated with 685 nm laser presented collagen network denser and collagen fibers thicker than controls; lesions treated with 830 nm laser presented a collagen network less dense than controls but with a pattern that resembles those observed in normal skin. We showed that low-intensity laser treatment affects cutaneous wound healing, but the effect change according to laser used. Further studies are necessary state adequate treatment protocols in special conditions, as when the wound healing is hindered.

P05**Effects of Er, Cr:YSGG Laser irradiation on endodontics system permeability.**

Ana, P.A.; Rocha, R.M.M.; Blay, A.; Aun, C.E.; Lage - Marques, J.L.; Zezell, D.M.

Doutoranda em Ciências pelo IPEN.

The aim of this study was to evaluate the effects of Er,Cr:YSGG laser irradiation on root dentin permeability. Twenty extracted single-rooted teeth were instrumented with K-files and divided in four groups, according to laser fluences: GI (non-irradiated), GII (12.5 mJ/pulse; 2.8 J/cm²), GIII (25 mJ/pulse; 8.5 J/cm²) and GIV (75 mJ/pulse; 16.98 J/cm²). Lased groups had an association of irrigating solution EDTA-T and Er,Cr:YSGG laser irradiation, which was performed at 20 Hz repetition rate without air-water spray, with four helicoidal movements during approximately 5 seconds. NDP associated with rhodamine B dye was used to evaluate dentin permeability. After the experimental period, the samples were transversely cut into six 2.0 mm thick slices for subsequent reading using the ImageLab software. The results showed that dentin permeability of root canals was decreased when exposed to Er,Cr:YSGG laser irradiation compared with non-irradiated samples, and this alteration was higher when higher fluences were applied. The cervical and middle thirds had permeability values statistically similar ($p > 0.05$) and significantly greater than the apical third. It can be concluded that the use of Er,Cr:YSGG laser irradiation at the utilized parameters decreases dentin permeability, favoring the root canal sealing.

P06**3D-Finite element and thermographic analysis of human teeth irradiated with ErCrYSGG.**

Ana, P.A.; Veloso Júnior, W.F.; Cláudio, T.; Zezell, D.M.
Doutoranda em Ciências pelo Ipen.

The purpose of this study was to analyse surface and pulpal temperature changes in extracted human teeth subjected to Er,Cr:YSGG laser irradiation by using Finite Element Method (FEM) and comparing with thermal analysis made by thermocouple and thermocamera. Twelve extracted human molar teeth were selected and divided into three groups, according to the following Er,Cr:YSGG laser irradiation conditions: 2.8 J/cm², 5.6 J/cm² and 8.5 J/cm². During laser irradiation, surface temperature was measured using a thermocamera (FLIR Systems - USA) and the pulpal temperature was monitored by means of a thermocouple type T placed in the pulpal chamber. For FEM analysis, it were constructed numerical models that reproduced a typical sound molar teeth and the analysis simulated the absorption of the laser energy and the heat transfer through the tooth in three dimensions, considering the same laser energy and conditions performed in thermocouple and thermocamera measurements. The results showed that theoretical FEM calculation showed good agreement with the thermocamera and thermocouple obtained data, simulating heat transfer and predicting the temperature increase. It was possible to conclude that 3D Finite Element Method gives good results that makes possible to understand the thermal behavior of dental material.

P07**The effects of diode laser irradiation to the dye-stained root canal walls.**

Anjo, T.; Ebihara, A. ; Takeda, A. ; Suda, H.

The effects of diode laser irradiation to the dye-stained root canal walls were preliminarily investigated. The root canals of anterior human teeth were cleaned and shaped, and stained with ophthalmic photosensitizer or methylene blue dye. An optical fiber (diameter: 0.4mm) was inserted into the root canal, and the root canal walls were irradiated using a diode laser system (ZHM1530JP, Matsushita Electric Industrial Co. Ltd., Japan) at 60mJ/pulse (pulse frequency:33pps). During lasing, the fiber tip

was moved perpendicularly from the apical portion of the root canal toward the canal orifice at a speed of 1mm/s. The root canal walls irradiated without staining were served as controls. Furthermore, the root surface temperature before and after the irradiation was measured, and the root canal walls were observed by scanning electron microscopy (SEM). The elevation of root surface temperature was within 10 ° in all groups. Therefore, we suppose that the periapical tissues may not be affected under the lasing condition used. The orifices of the dentinal tubules were sealed with melted dentin in the ophthogreen and methylene blue groups, while the root canal walls in the control group were rarely affected by laser irradiation under SEM observation.

P08

Effects of Nd:YAG and diode laser irradiation on the root surface with or without dye: thermal analysis.

Aoki, T.; Fukuda, M.; Miwa, K.; Sanaoka, A.; Suzuki, S.; Noguchi, T. .

The laser absorption is dependent on the color of target material. The aim of this study was to investigate the effect of dye on temperature rise after Nd:YAG or diode laser irradiate. Methods: Root surfaces were irradiated for 1minute using 0.8W, 0.9W, 1.0W, 1.2W of Nd:YAG laser (1064nm) or 0.9W, 1.0W of diode laser (805nm). The temperature was monitored by using type K thermocouple positioned in the pulp chamber. The distance between samples and fiber was set at 0mm and 5mm. Indian ink was used for Nd:YAG laser and indocyanin green was for diode laser. Result: It was observed that the closer the distance between fiber and root surface, the higher the temperature of pulp chamber. We also found that the temperature of the pulp chamber rose rapidly after laser irradiate with dye over 10 seconds. In addition, at 60th second, the temperature of laser irradiation with dye was higher than that without dye. Conclusions: The results of this study suggest that it is desirable to perform combined use of laser and dye within 10 seconds. And it also suggests a need to irradiate carefully over 10 seconds.

P09

Spectroscopic analysis and interaction of different bleaching agents with 660nm laser and 470 nm LED.

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Doutorando em Dentística USP.

The aim of this in vitro study was to verify the effect of different dental bleaching methods regarding the achromatic enamel color change. Forty-five bovine teeth were immersed in a darkening solution and then divided into nine experimental groups with five samples in each group. The color measurement was initially taken using a digital colorimeter. The teeth were submitted to the bleaching with three bleaching gels, without any activation source (control) and with two wavelengths (660 nm diode laser and 470 nm LED). The previous analysis of the absorption spectra enabled the choice of an adequate wavelength in order to enhance its photochemical action. The second color measurement was taken after all the treatments. The data were submitted to ANOVA and Tukey parametric statistical tests (p=0,05). It was observed that: 1) there was a statistical significant difference between the activation sources; 2) there was statistical significant difference regarding the interaction among the activation sources and the bleaching gels when compared with each other. The activation methods of the bleaching agents, even promoting color changes in distinct levels, still require further studies capable of detecting a higher absorption spectrum of a product and which presents significant clinical results.

P10

Effect of low power laser irradiation (660nm) on human fibroblasts growth.

Azevedo, L.H.; Eduardo, F.P.; Moreira, M.S. ; Eduardo, C.P. ; Marques, M.M.

Doutoranda em Diagnóstico Bucal pela FOU SP.

The aim of this in vitro study was to analyse the effect of different power densities of a low-power diode laser on the biomodulation of human gingival fibroblasts. The cells were cultured in nutritional deficit. Laser irradiation was carried out with a low intensity GaAlAs laser (660nm; fluency of 2J/cm²). The irradiation was done twice with 12-h interval, using the punctual technique, at continuous mode and in contact. The cells were plated in Petri dishes (n=27) and randomly divided into 3 experimental groups, as follows: I- control group: not irradiated; II- power of 10mW and intensity -142,85mW and III- power of 29mW and intensity - 428,57mW. Growth curves were obtained by counting

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the cell numbers, in triplicate, 2, 6 and 9 days after the first irradiation in a hemocytometer using the Trypan blue dye exclusion assay. The cell growth of the irradiated groups was significantly higher than control group ($p > 0,05$). The cultures of Group II presented cell growth superior to that of Group III. The growth stimulation was inversely proportional to the radiation intensity. It was concluded that the diode laser stimulates cell growth of human cultured gingival fibroblasts. At low intensity, the radiation increases this biostimulatory effect.

P11

In vitro effect of Nd-YAG and diode lasers in the apical dentinal structure after retrograde preparation.

Aun, C.A.; Gavini, G.

Doutorando em Endodontia pela FOU SP.

The aim of this study was to evaluate, in vitro, the dentinal structure, the dentinal tubulis condition and the adaptation of the MTA retrobturation after previous irradiation of Nd:YAG and Diode in the ressected apical surfaces. For that, 15 unirradicular human teeth were shaped, filled and apicectomized with FF diamond drill, where a retrograde cavity with ultrasonic tip was made. The specimens were divided into 3 groups: G1 - MTA without Laser; G2 - MTA with Nd:YAG, in the specifications: 1,5W, 15Hz, 100mJ, 10 applications of 5s with a 20s interval and 1mm of distance; G3 - MTA with Diode GaAlAs (810nm; ZAP Soft-lase), in the specifications: continuous pulse, 2W, 10Hz, 5 applications of 5s with a 5s interval and 0,5mm of distance. All the irradiations were made inside a prepared device that simulates a bony cavity, recreating the surgical difficulties of access and humidity control. All the specimens were retrobturated with MTA inside the dedvice. After 7 days at 3°C, the specimens were prepared for observation in sweeping electronic microscope (SEM). X images of each group were obtained, being Y for the surfaces and Z for the marginal adaptations.

P12

Use of the low Intensity laser in the Treatment of TMD- A clinical case report.

Barbosa, R.G. ; Almeida, E.C.B. ; Menezes, M.R.A. .

The temporomandibular joint dysfunction and the structures it associates interest and worry the surgeon-dentists,

in virtue of its frequency and painful symptomatology causing difficulties in the mandibular movement to the TMD carriers. The treatment of the TMD is ample and varied and the result it depends, basically, of the perfect patient/profissional relationship. Physical and pharmacological methods compose a therapeutical alternative, however, the results are not of all enough for the complete the pain relief. The laser therapy comes presenting good results in the relief of the pain and the inflammatory process of the TMD. Thus, the authors if consider to present a protocol of application for the laser of Gallium Aluminium Arsenide, to show to the density of used energy and the modality of application in the different indicated points.

P13

Er:YAG laser for the treatment of gingival hyperplasia and/or hypertrophy.

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Hyperplasia is an increasing volume of tissue due the increase number of cells and is different from hypertrophy that corresponds to an increased volume of each cell. Clinical forms are mainly gingivitis due to anticonvulsive drugs, idiopathic gingivitis or gingival fibromatosis or epulis. Hypertrophy involves both the adherent and marginal gum and the papilla area, on both vestibular and lingual sites, covering partially to totally the dental surfaces. Gingival hypertrophy may be observed during the development of permanent teeth, impeding their growth. Therapy is based on surgery but recurrence is frequently observed. Er:YAG laser technology takes place, today, in the surgical treatment. Observations on different clinical forms, were conducted and based on the following parameters (Fotona Fidelis Plus): 150 mJ/pulse, 40 Hz, non contact handpiece (spot size 0.8 mm, VSP mode 100 μ s), power density mean range 1200 W/cm². Results were clinically satisfactory and discussion is based on bleeding, healing and recurrence.

P14**Diode and Nd:YAG laser frenectomy.**

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Laboratory of Surfaces Interfaces in Odontology, University of Nice Sophia Antipolis (France).

This study evaluated the clinical efficiency of laser technology (diode and Nd:YAG) for frenulum excision in case of interincisive diastema. Before orthodontic therapy, due to the correlation between the persistence of a maxillary medium frenulum and the presence of an interincisive diastema, frenulectomy is highly recommended.

Frenulectomy is advisable when the following anatomical conditions are observed:

Frenum is attached to papillar gingiva and mobilization of lips (traction test) causes a moving of marginal gingiva of upper central incisors.

Frenum reaches the upper part of the gingival septum and becomes blurred with bunoid papilla.

Transversal dimension of frenulum and density of tissue interposed between central incisors cause a very large diastema (6-8mm).

Three lasers were clinically compared:

Diode (Oralia Jet20): 810nm, PPR 10000Hz, fiber 400 m, PD: 15923 W/cm².

Diode (MC4 15W): 980nm, HSF 10000Hz, fiber 400 m, PD: 7961W/cm².

Nd:YAG (Fotona Fidelis Plus): 1064nm, fiber 320 m.

In all clinical cases, a contact anaesthetic was used. Bleeding was strongly reduced and good and rapid recovery of the wounds was obtained. After one or two weeks, healing was observed. An adequate program set out in cooperation between orthodontist, periodontist and oral surgeon is needed to solve interincisal diastema.

P15**Hybrid layer thickness and morphology: Influence of cavity preparation with Er:YAG laser .**

Barcelheiro, M.O.; Miranda, M.S.; Dias, K. ; Mello, J.B. Prof. Titular de Laser em Odontologia da FESO.

The objective of this study was to compare the hybrid layer thickness and morphology formed utilizing Scotchbond Multipurpose Plus (SBMP) on dentin, prepared with a diamond

bur in a high speed handpiece and dentin prepared with an Er:YAG laser. Flat dentin surfaces obtained from five human teeth were treated with the two methods, and then were treated with the dentine adhesive system. After a layer of composite was applied, specimens were sectioned, flattened, polished and prepared for SEM observation. Ten different measurements of hybrid layer thickness were obtained along the bonded surface in each specimen. Results showed that SBMP produces a $3.43 \pm 0.75 \mu\text{m}$ hybrid layer in dentine prepared with diamond bur. This hybrid layer was regular and constantly found. In the laser group, the dentine adhesive system produced a $1.54 \pm 0.35 \mu\text{m}$ hybrid layer, which was very irregular and was not found constantly. Statistical analysis of variance ($p \leq 0,05$) showed that there was a statistically significant difference between the groups. The authors concluded that the Er:YAG laser, with the parameters used in the experiment, is not a preparation method which allows a thick hybrid layer formation, in opposition to the use of a diamond bur in a the high speed turbine.

P16**"In vitro" evaluation of morphologic changes on the root dentine irradiated by CO2 laser associated or not to calcium hydroxide.**

Camargo, A.; Baldochi, S.; Camargo, S.; Eduardo, C.P. Mestre em Laser pelo IPEN/USP.

This in vitro study has evaluated the structural changes on the root dentine irradiated by a CO2 laser associated or not to calcium hydroxide - an alternative method for dentine hypersensitivity treatment. Fourteen human teeth 3rd molars were utilized, divided into 7 groups. Group I (control group), Groups II, III and IV received an application of Ca (OH)₂ paste followed by CO2 laser irradiation for 5 seconds, intervals of 10 seconds, continuous emission, power of 0.5W, constant distance of 30mm (Group II), 1.0W (Group III), 1.5W (Group IV); Groups V, VI, VII received laser irradiations following the same parameters applied to groups II, III, and IV. Morphologic changes suggesting to fusion and re-solidification were observed, and the presence of material obstructing the whole analyzed surface on groups II, III, and IV. For groups V, VI, and VII, fusion, re-solidification, and cracks, were observed, results statistically significant ($P < 0,01$). No statistically significant differences were observed in groups that used the same treatment. Powers above 1.0W (DP=

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125,38W/cm²) showed carbonization and dark surface, results unfavorable due to the undesirable morphologic alterations and aesthetic compromising.

P17
Evaluation of Er:YAG, CO₂ and Nd:YAG lasers on apical dentine permeability after apicoectomies.

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Laboratorio de Endodontia / FORP-USP

Apicoectomy is a surgical procedure that consists of radicular apex resection, eliminating periapical lesion. This study evaluated the effect of CO₂ and Nd:YAG lasers on root dentine permeability after apicoectomy with Er:YAG laser. Forty-four single-rooted teeth, obtained from the Endodontic Laboratory stock from the Faculty of Dentistry of Ribeirão Preto, University of São Paulo, were used. The teeth were instrumented with the step-back technique, irrigated with 1.0% sodium hypochlorite and sealed with Sealer 26 (Dentsply, Brazil) and lateral condensation. The samples were divided into four groups of 11 teeth each that had the root sectioned 2 mm from the apex: G1 - roots were sectioned with a 4138 diamond bur with cooling; G2 - roots were sectioned with pulsed Er:YAG laser at the following parameters: 15 Hz and 250 mJ; G3 - roots were sectioned with pulsed Er:YAG laser and Nd:YAG laser (10 Hz, 100 mJ, and 1 W) was applied on the sectioned surface; G4 - roots were sectioned with pulsed Er:YAG laser and CO₂ laser (5 W, 10 seconds ON and 20 seconds OFF) was applied to the sectioned surface. The teeth were then impermeabilized with cyanoacrylate and placed in 0.5% methylene blue for 7 days. The proximal surface of the samples was removed for exposure of the sealed root canal and dye penetration was measured by means of microscopic evaluation. The results showed a statistically significant difference at the level of 1%. We conclude that all treatments presented microleakage and can be placed in increasing order: Er:YAG (G2), Bur (G1), Er:YAG + CO₂ (G4) and Er:YAG + Nd:YAG (G3); Er:YAG laser presented the lowest microleakage values, showing its viability for clinical use in apicoectomies.

P18
Proliferation of induction cellular in cells in culture of carcinoma (H.Ep.2): Laser Light.

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Centro de Laser - Universidade Federal da Bahia.

The objectives of this work were to evaluate the influence of time, treatment and wavelength, through the assessment of the cellular viability with MTT, on the proliferation of H.Ep2 cells submitted or not to laser irradiation (685nm and 830nm) with same energy density (45 and 60J/cm²). H.Ep2 cells were cultured on flasks and maintained in DMEM medium (10% FBS, 1% L-glutamine and 1% antibiotic solution) and irradiated with lasers of 685nm and 830nm and stained at times six, 12, 24, 48 and 72 hours after irradiation. There were significant differences when the groups were compared. Time influenced significantly only 830nm group. In conclusion, time, treatment significant influence in proliferative process of H.Ep2 cells.

P19
Study by photoreflectance spectroscopy by vickers hardness of conventional and Argon laser tooth bleaching .

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Doutoranda em Engenharia Biomédica pelo Instituto de Pesquisa e Desenvolvimento (IP&D-UniVap).

Twenty human embedded third molars were used in this in vitro study to evaluate the effects of two bleaching products associated or not with Argon laser irradiation. The specimens were divided at random into 5 groups and submitted to the traditional power bleaching procedure for enamel. Two bleaching products were used in this experiment: 35 % carbamide peroxide solution (Opalescence Quick) and 37% carbamide peroxide solution (Whiteness Super - FGM). Group 1 was control group. Group 2 was exposed to 37 % carbamide peroxide bleaching solution and developed with an Argon laser application. The same solution was used in Group 3 but the bleaching was developed with a halogen lamp irradiation. The 35 % carbamide peroxide was used in Groups 4 and 5. One was developed as in Group 2 and the other as in Group 3.

The samples were analyzed under Vickers microhardness tests, investigating indentation impressions on the samples. In addition, the samples were submitted to a photoreflectance experiment. It was observed that Group 2 presented more white spectra than Group 3. However, Groups 4 and 5 showed the same results inde-

pendent of the use of the laser or the halogen lamp. Comparing both bleaching products, the 35 % carbamide peroxide was more efficient on its purposes than the other one. The statistical analysis was applied to the Vickers microhardness date. No significant difference between the two bleaching products was observed.

P20

Techniques of dental bleaching with diode laser.

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Especialista em Dentística Restauradora pela FOP-UNICAMP.

The technique of dental bleaching has been widely indicated in esthetic procedures performed at dental office. The aim of this paper was to evaluate the results of two techniques of bleaching treatment, using infrared diode laser (Biolux Laser - Bio-Art). Two clinical cases were performed with 37% hydrogen peroxide (Whiteness HP - FGM) and 35% carbamide peroxide (Whiteness Super - FGM), at only one session. The application of bleaching materials and the laser unit were made according to the manufacturer' instructions. The color shades of the central incisor teeth were measured before and after the bleaching, following the Vita scale. In both cases, there were reduction in the color shades, which changed from the color A4 and A3 to A2 and A1, respectively. Minimal sensitivity, during and post-bleaching was reported by the patients. Both techniques used for dental bleaching produced a significant esthetic effect, without discomfort for the patients.

P21

Oral mucositis induced by conditioning regimen in autologus hematopoietics steam cell transportation (HSCT) treated with low level laser (LLL) .

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Mestranda do Curso de Pós-Graduação em Clínica Médica do Hospital Universitário Clementino Fraga Filho (UFRJ) - Hematologia - Transplante de Medula Óssea .

Oral mucositis occurs in the majority of patients undergoing HSCT due to the chemotherapeutic regimen used. All oral mucosae, lips and oropharynx are damaged, with a breakdown of the mucosal barriers, serving as portal of entry for microorganisms. We report the case of a 19-years old male with Hodgkin's

disease who underwent neck radiotherapy before HSCT with a conditioning regimen consisting of BCNU,etoposide,cytarabine and melphalan. After 5 days,severe oral mucositis(grade IV) developed. Acyclovir,systemic antibiotics and antifungals were given,but there was no improvment.LLL therapy was started (diode source laserbeam device, Laser Solution,Inc,Niterói-RJ,with 660nm wavelenth and 50 mw potency- III-B Class-, with 2J/cm2 per spot, with approximately 1cm between the spots. After 2 applications, a significant improvement was observed, that continued throughout the course of treatment.LLL represents a suitable option for the treatment of severe chemotherapy-induced oral mucositis.

P22

Oral mucositis treated with low level laser (LLL) therapy in a patient with acute lymphocit Leukemia .

Ana Chor, A.; Azevedo, A.M.B.; Nucci, M..

Mestre do Curso de Pós-Graduação em Clínica Médica do Hospital Universitário Clementino Fraga Filho (UFRJ) - Hematologia - Transplante de Medula Óssea .

A 5-years old male was admitted with a diagnosis of acute lymphocytic leukemia. After induction chemotherapy the patient developed neutropenia, fever and severe mucositis (grade III). After six days of supportive therapy with antibiotics, the mucositis worsend. Low-Level laser therapy was started with one session every other day with a diode source Laserbeam device (Laser Solution,Inc,Niterói-RJ), 660nm wavelength and 50mw potency (III-B Class) and Energy of 2J/cm2 per spot and approximately 1 cm between the spots.. After ten sessions a complete disappearace of the mucositis was observed. Laser therapy is supposed to act by inducing analgesia and to promote tissue repair and reduce inflammation.

P23

Polarized light (400-2000 nm) and non ablative laser (685 nm): a description of the wound healing process using immunohistochemical analysis.

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Doutoranda em Laser UFBA, Bahia.

This study aimed to assess through morphologic and cytochemi-

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cal analysis, the healing process of wounds submitted or not to non-ablative laser of 685nm or polarized light of 400-2000nm. Thirty male rats were submitted to standardized wounds, and these were irradiated either with laser light(G2 and G3) or with polarized light(G4 and G5), at doses of 20 or 40 J/cm². The control group(G1) received no irradiation. Animals were irradiated every 48 hours for 7 days, starting immediately after surgery, and euthanized on day 8. Specimens were routinely processed for microscopic analysis. Results showed that collagen fibers were stimulated in all irradiated groups, suggesting that the healing process was promoted, with acceleration of the repair. As to myofibroblasts, the laser groups showed a less expressive population of these cells as compared to the control group. This is related to lower wound contraction. We believe that the laser would be more suitable for areas with larger aesthetic involvement. On the other hand, the treatments with polarized light presented a higher myofibroblast expression than the control group in the microscopic description. We suggest the use of polarized light for extensive wounds, which require higher contraction, better closing and coverage of the exposed areas.

P24

Assessment of the presence of myofibroblasts on both conventional and Co2 Laser wounds.

Cunha, S.S.; Pinheiro, A.L.B.; Oliveira, M.G ; Ramalho, L.; Pozza, D.; Freitas, A.C..

Doutoranda em Laser UFBA, Bahia.

Wound contraction of both traumatic and surgical origin may reduce or limit the function of the tissue. Myofibroblasts are cells involved on the process of wound contraction. This study aim to assess quantitative and statistically the presence of myofibroblasts on both conventional and CO₂ Laser wounds. Thirty-two animals (*rattus norvegicus*) were divided into four groups and operated using either the CO₂ Laser(A1 and A2) or conventional scalpel(B1 and B2). The animals were sacrificed eight days(A1 and B1) and 14 days post-operatively(A2 and B2). The specimens were routinely processed for Immuno-histochemical and analyzed under light microscope. The results show that it is possible to determine the number of myofibroblasts in these wounds. The number of myofibroblasts at day 8 is significantly higher than at day 14th. Comparison of the two techniques at day 8 shows significant differences between both groups (Laser,p=0.007 and Scalpel,p=0.001). The number of cells on group B1 is significantly higher than on group A1(p=0.001). However at the 14th day

there is no such difference(p=0.072). It is concluded that the small number of myofibroblasts at day eight after CO₂ Laser wound may be the reason why contraction on this wound is smaller than the one observed in conventional surgery.

P25

Gingival regeneration after low-level laser irradiation.

Damante, C.A.; Santana, A.C.P.; Passanezzzi, E.; Taga, R.; Greggi, S.L.A.

FOB/USP

The aim of this study was to histologically evaluate the effects of the diode laser (GaAlAs) on gingival healing. After assigning a consent form, 13 patients presenting inflammatory gingival hiperplasia were submitted to gingivoplasty. The right hemi-arch (Test group) was irradiated with a 4J/cm² dose in a 48-hour interval during one week. The left hemi-arch (Control group) did not receive additional treatment. Incisional biopsies were performed on both sides at 7, 14, 21, 60 days after surgery. Histological slides were analyzed morphometrically. Epithelial width, luminal-to-basal ratio, nuclear and cell volume densities of each layer of epithelium, nuclear and cell volumes for basal and spinous layers, absolute number of inflammatory cells were determined for both groups. Data was statistically evaluated by Student's t test (p<0,05). There was an increase in epithelial width with time, from 260,58 m to 393,54 m, a decrease in luminal -to-basal ratio from 0,4 to 0,28. Volume densities of basal layer (20,20%), spinous layer (55,60%) and corneal layer (24,20%) were stable during studied period. The same stability was observed to nuclear and cell volumes of basal and spinous layers. An increase in fibroblasts number from 519.99 to 946.11 was observed. There was a peak in neutrophil number (6.10 cells/mm²) at 7 days after surgery at test group, while the mononuclear peak (43,89 cells/mm²) occurred at 15 days after surgery ant control group. There were no statistical significant differences between groups showing that low-level laser therapy did not influence gingival regeneration.

P26

Fiber tip processing for the application of Nd:YAG laser to Endodontics.

Ebihara, A.; Anjo, T.; Noguchi, H.; Takase, T.; Takeda, A.; Suda, H. .

Root canal treatment using laser is one of the hottest topics in endodontics. Recently, a fine flexible quartz fiber has been developed to transmit a laser beam and concentrate it on a specific area. It can be inserted into the narrow root canal. However, it is still difficult to irradiate laser to the whole canal walls, because laser beam advances straight. In this study, the fiber tip was preliminarily processed to irradiate Nd: YAG laser to the root canal wall. An optical fiber (diameter 400µm) made of quartz and a Nd:YAG laser system (DENTAL LASER DL-1, Mani Inc.) were used in this study. The fiber tip was processed using a processing pad containing calcium carbonate. Then, Nd:YAG laser was irradiated, and the direction of laser beam was investigated using a power meter. Moreover, the fiber tip was observed by scanning electron microscopy (SEM). Laser beam was irradiated not only at the straight direction but also at the lateral direction. SEM observation indicated that the fiber tip was processed, as intended. Nd:YAG laser irradiation using the processed fiber tip might be useful for root canal preparation and disinfection, although more study is necessary for its clinical application.

P27

Chemical Modification of bovine dental enamel irradiated with holmium laser .

Eduardo, P.L.P.; Bachmann, L.; Salvador, V.L.; Zezell, D.M. This study investigated Ho:YLF (2,065 nm) effects on dental enamel with regards to the thermal variations in the pulp chamber during irradiation and resistance to demineralization. Twenty samples of bovine enamel were divided: 1) control- acidulated phosphate fluoride (APF) topic application followed by demineralization treatment with lactic acid; 2) Ho:YLF irradiation (100J/cm²) followed by APF and demineralization; 3) Ho:YLF irradiation (350J/cm²) followed by APF and demineralization; 4) Ho:YLF irradiation (450J/cm²) followed by APF and demineralization. All samples were quantified according to their calcium and phosphorous atoms relative concentrations before and after the treatments. X-Ray fluorescence spectrochemical analysis showed an increase on the calcium and phosphorous atoms concentration ratio and therefore the enamel demineralization reduction as a result of the lactic acid treatment in the samples irradiat-

ed with the holmium laser followed by the APF (ANOVA, Tukey $p < 0,01$). To evaluate the feasibility of this study for clinical purposes, surfaces morphology were analyzed. Modifications were characterized by melted and re-solidified regions of the enamel, which can changes its permeability and solubility. Temperature changes of ten human pre-molars teeth irradiated with 350 J/cm² and 450 J/cm² were also monitored in the pulp chamber in real time. Temperature increases were limited to 4,2° C.

P28

Effects of Nd:YAG and diode laser irradiation of the root surface: Morphological analysis.

Fukuda, M.; Aoki, T.; Suzuki, S.; Sanaoka, A.; Ting, C-C.; Monguchi, T. .

The aim of this study was to evaluate morphological alterations of root surfaces after Nd:YAG and diode laser irradiation. Methods: Root specimens obtained from extracted periodontally involved teeth were sliced and polished. Root surfaces were irradiated by Nd:YAG laser (1064nm) at energy of 2.0W (100mJ/20pps, 200mJ/10pps) or by diode laser (805nm) at energy of 2.0W (10W/20%, 20W/10%). The laser profile microscope was used for evaluation of root surfaces roughness. Results: The roughness of root surfaces was expressed by roughness average (Ra) value. The Ra value of the polished root surfaces was 1.02. The Ra values of the root surfaces which was irradiated using Nd:YAG laser were 1.56, 2.40, and the Ra values of diode laser were 1.37, 1.27. In addition, the Ra value of root planing using a scaler was 1.30. Conclusions: The Ra value of the root surfaces which were irradiated by Nd:YAG laser at 200mJ/10pps was the biggest in all of the test. However, no significant difference was observed between Nd:YAG laser at 100mJ/20pps, diode laser and root planing.

P29

Intrapulpal temperature variation in primary teeth during cavity preparation using: Er:YAG laser and conventional high-speed drill.

Fernandes, A.S.F.; Navarro, R.S.; Gontijo, I.; Haypek, P.; Zezell, D.M.; Haddad, A.E. .

Increases of temperatures superior than 5-5.5°C can compromise the pulp vitality. The purpose of this in vitro study was to com-

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pare the variation of the pulp temperature in primary teeth during the cavity preparation. Twelve primary lower incisors (Human Tooth Bank-FOUSP) were divided in 4 groups (n=3): cavity preparations were performed at buccal surface, refrigerated by air-water spray, during 20sec, using #1090 diamond burr in high-speed drill in carious-free incisors (G I) and carious incisors (G II); or Er:YAG laser (2.94 μ m)(KaVo 3)(LELO-FOUSP), with 6Hz repetition rate/ 600mJ energy as orientated by manufacturer, in carious-free incisors (G III) and carious incisors (G IV). The variation of temperature was measured using digital oscilloscope and thermocouple type K placed inside the pulpar chamber, simultaneously the teeth was kept under water thermal bath during the procedures. The temperatures rises were less than 4°C in all cavities preparations in different groups, the variation of temperature in laser and conventional high-speed drill groups showed similar values. The groups of carious teeth showed higher increase of temperature than carious-free teeth. The Er:YAG laser demonstrated be a safe alternative for cavities preparations in primary teeth, since that using effective and safety parameters by qualified and trained professionals.

P30

Nd:YAG laser influence on microtensile bond strength of different.

Ferreira, L.S.; Navarro, R.S.; Calheiros, F.C.; Francci, C.E. The aim of this study was to evaluate microtensile bond strength (MTBS) of different adhesive systems to dentin treated with Nd:YAG (1.064nm). Buccal surfaces of twenty-four bovine incisors were grounded with #180-600 grit sandpaper disks to flattened coronal and root dentin surface. Samples were distributed into groups: total etch adhesive (Scotchbond Multipurpose-SBMP, 3M-Espe) or self-etching primer (SE Bond- SEP, Kuraray), light cured, irradiated or not with Nd:YAG laser (ADT-USA), no contact optical fiber (320mm), using energy parameters: (0.8W/10-20Hz, 1.2W/10-20Hz). A composite crown was built over bonded surfaces and stored in water. Specimens were sectioned vertically into slabs, trimmed into a hourglass shape with narrowest portion at bonded interface with a cross-sectional of 0.8mm². MTBS testing was performed at a crosshead speed of 1mm/min in a Kratos Universal Testing Machine. Mean bond strength (MPa \pm SD) were analyzed by ANOVA and Tukey test ($p < 0.01$) showed that: on control group SEP showed statistically

higher value (31.26 \pm 15.71) than SBMP (24.3 \pm 10.66), on lased groups there were no significant difference between SEP (20.34 \pm 10.01) and SBMP (22.43 \pm 9.82); control groups (27.81 \pm 1.38) showed statistically higher value than lased group (21.37 \pm 0.99); on lased groups 0.8W/10 showed the highest value (25.54 \pm 11.74). Nd:YAG laser influenced the bond strength of both adhesive systems.

P31

Morphological analysis of resin/dentin interface of different adhesive systems associated with Nd:YAG laser.

Ferreira, L.S.; Navarro, R.S.; Calheiros, F.C.; Francci, C.E. The aim of this in vitro study was to evaluate the morphology of resin/dentin interface after different adhesive systems treatment following or not Nd:YAG (1.064nm) laser radiation. Buccal surfaces of twenty-four bovine incisors teeth were grounded with #180-600 grit sandpaper disks to flattened coronal and root dentin surface. Samples were distributed into different groups in according to dentin surface treatment: total etch adhesive (Scotchbond Multipurpose- SBMP, 3M-Espe) or self-etching primer (SE Bond- SEP, Kuraray), light cured and following or not irradiation with Nd:YAG laser (ADT-USA), scanning surface during 60s with no contact optical fiber (320mm), using different parameters (0.8W/10-20Hz, 1.2W/10-20Hz). A composite crown was built over bonded surfaces and stored in water (24h/37°C), specimens were sectioned vertically into slabs. The samples were fixated, dehydrated in ascending ethanol and immersed in 1%NaOCl and 6N HCl solutions; sputter coating for examination under SEM. The SBMP created thicker smear layer and relatively long resin tags; SEP created thin hybrid layer and short resin tags; Nd:YAG laser radiation promoted thermally changes on resin/dentin interface and under dentin, creating a "modified layer" with melting of hybrid layer. The Nd:YAG laser promoted morphological changes on resin/dentin interface with both adhesive systems evaluated.

P32

Orthodontic brackets placement with ER:YAG laser. a new technical approach.

Fornaine, C.; Semez, G.; Baldissari, A.; Bertrand, M.F.;

Rocca, J.P.

Laboratory of Surfaces Interfaces in Odontology, University of Nice Sophia Antipolis (France).

The aim of this clinical observation was to demonstrate that Er:YAG laser enamel preparation followed by acid etching is a secure, simple and rapid technique for bracket placement. Even if some contradictions appear in the literature, it seems that adhesion of bonded resin to Er:YAG laser prepared enamel plus acid etching is stronger as compared with conventional method (acid etching alone). To obtain a rough surface during enamel laser preparation that corresponded exactly to the surface of the bracket, a special ceramic screen was used in this study. The laser parameters were low to prepare the enamel surfaces (Fotona Fidelis Plus, 40mJ/pulse, 10Hz, VSP mode, work in contact mode with a 0.8 mm sapphire tip, PD: 8W/cm², fluence: 0.8J/cm²). The laser-treated enamel was immediately submitted to 37% orthophosphoric acid gel for 15 sec. Then, the bracket was bonded in a conventional mode. This original and rapid technique allowed satisfactory retention of the orthodontic brackets without any damage to the surrounding enamel surfaces.

P33

Er:YAG laser as a help for crown lengthening.

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1 Laboratory of Surfaces Interfaces in Odontology, University of Nice Sophia Antipolis (France)

2 Liège University (Belgium)

Application of the crown preparation guidelines provides an evidence-based rationale for clinical practice procedure. Crown lengthening techniques are conducted in order to recreate the clinical space necessary for prosthetic restoration and osseous surgery is often required. Er:YAG laser technology allows a new surgical approach. Clinical observations were conducted using the following parameters (Fotona Fidelis Plus): 150 mJ/pulse, 40 Hz, contact mode (sapphire tip, 1 mm in diameter) or non contact mode (spot size 0.5 mm), power density ranging from 1200 W/cm² to 765.31 W/cm². During surgical crown lengthening, the bone level was lowered for placement of prosthetic margin and reestablishment of the biological width. The recognized importance of restorative margin location, materials and contours related to periodontal health may be operated in acceptable clin-

ical conditions when crown lengthening is managed with an Er:YAG surgical approach.

P34

Ultrastructural aspects of wound healing of rat oral mucosa after CO₂ laser labial frenectomy.

Fonoff, R.D.N. ; Eduardo, C.E.; Watanabe, L-S..

Mestre e Doutor em Odontopediatria pela FOU SP, Professor Titular de Odontopediatria da UNIP-Sorocaba.

The aim of this study was to evaluate the effects and wound healing of rats' oral mucosa after frenectomy. Twenty four rats were used (two groups of 12) in the study. After anesthesia, CO₂ laser frenectomy was performed in the lower labial, using a continuous mode 4 W setting (Group I) and followed by Ga-Al-As laser application during 3 minutes (Group II). The rats were killed immediately, 1, 3, 5, 7, and 10 days after surgery, two animals each period. After adequate preparation, the samples were mounted in metallic stubs, coated with gold and examined in the scanning electron microscope. The results showed that CO₂ laser irradiation produced the evaporation of the epithelium and adjacent connective tissue, and formed a wide crater and carbonized surface. The epithelial cells were formed from the periphery to central region, becoming evident at the 5th day. At 7th and 10th day after surgery, the samples were still in wound healing, with better re-epithelialization in the specimens of group II. It was concluded that CO₂ laser frenectomy produced peculiar biological effects, immediately after irradiation and in wound healing; and, that Ga-Al-As laser application after CO₂ irradiation demonstrated a slight acceleration in the wound healing process.

P35

The use of CO₂ and diode lasers in Oral Leukoplakia.

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Laboratório Especial de Laser em Odontologia), FO - USP.

The World Health Organization (1978) defined oral leukoplakia as a white patch or plaque that cannot be characterized, clinically or histopathologically, as any other disease. The objective of this study was to evaluate the efficiency of CO₂ and diode lasers in the treatment of oral leukoplakia. Thirteen patients (7 female and 6 males; mean age of 53.7, range 23-79), with white plaques

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diagnosed clinically and histopathologically as leukoplakia, were evaluated. Histopathologic examination reported 4 cases with no dysplasia, 4 with moderate dysplasia and 5 with severe dysplasia. Patients, through random criteria, were treated with CO₂ laser (7 patients) or diode laser (6 patients). Results showed that both lasers were efficient in eliminating areas of oral leukoplakia, allowing for a complete bleeding control during and after surgery, in addition to reducing surgery length of time. Symptoms were well tolerated during postoperative phase, and the healing process was uneventful. Recurrence was observed in only one case, although the follow-up period (mean time 3 months) is short to allow for an accurate evaluation. Conclusion: laser beam has shown to be an efficient method for treatment of oral leukoplakia, a lesion characterized as potentially malignant.

P36

Treatment of hemangioma with Nd:YAG Laser.

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Mestrado em Cirurgia e Traumatologia Bucomaxilofacial, Pontifícia Universidade Católica do Rio Grande do Sul.

Nd: YAG laser is indicated for hemangioma's treatment because its low absorption and high tissue penetration. It can be useful to achieve vascular obliteration, for tissue ablation and remotion. It was presented two cases of hemangioma treated with Nd: YAG laser. Case I - Patient presenting gingival and lower lip hemangioma was treated by three sessions of low laser (100 mJ, 20 Hz, 2,0 W), every 15 days, to achieve vascular obliteration. It was observed a lesion decrease, precluding complementary surgical remotion. Case II - Patient presenting lower lip hemangioma, was submitted to only one ablative application (120 mJ, 40 Hz, 4,8 W), without hemorrhage and with reduced local inflammation. Suture was not necessary, resulting in small quantity of fibrosis, without tissue retraction.

P37

A histologic assessment of the association wavelenghts of low intensity laser therapy on wound healing in rats.

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Titular em Periodontia, Faculdade de Odontologia de

Marília - UNIMAR.

The aim of this study was to histologically assess the effect of association of different wavelength (685 nm and 780 nm GaAlAs laser) on the healing process in cutaneous wound in rats. Seventy-two rats divided into 3 groups were used: Group I (control), Group II (685 nm laser) and Group III (685 nm + 780 nm laser). In Group II, the laser was applied continuously with 50 mW, during 80 s (3 J/cm²). In Group III, the laser of 685 nm was applied during 40 s (1.5 J/cm²) followed of laser of 780 nm for 40s (1.5 J/cm²). The diameter of the wound was measured at baseline, 3, 7 and 14 post-operative days and the results were submitted to statistical analysis. At intervals of 3, 7 and 14 days, 8 animals of each group were sacrificed and the pieces were submitted to histological analysis. The statistical results showed that the greatest degree of contraction was observed in Group III, followed by Group II and I. The wound healing process was more differentiated in groups II and III. It is concluded the association of 685 nm with 780 nm had a positive effect on the repair of wound.

P38

Ablation rates and morphological patterns of deciduos enamel teeth after Er:YAG laser irradiation.

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Doutoranda em Odontopediatria pela Faculdade de Odontologia de Araraquara UNESP/ IFSC - USP .

The aim of this "in vitro" study was to analyze the morphology, diameter, depth and volume of the cavities prepared in deciduous teeth using laser.

Fourteen exfoliated teeth were irradiated by Er:YAG laser system (Twin-light Laser Dental, Model S, Medical Lasers, Slovenia) that emitted at a wave length of 2.94 μ m with a spot size of 0.70 mm set at 200 and 300 mJ of energy per pulse and 10 Hz of frequency, applied during 10 seconds. The morphology, diameter and depth of the cavities were measured on scanning electron micrographs using a modified cephalometric program and the volume was calculated after the knowledge of all parameters. The cavities presented round shape and flakes or scales pattern were observed in the ablated region. There was no significant statistical difference in the diameter of the cavities when 200 mJ (1033.37 μ m) or 300 mJ (1083.75 μ m) were used. The depth was statistically greater when energy was increased (153.69 μ m and

296.67 m to 200 and 300 mJ, respectively). The volume also increased when 300 mJ was used. Our finding indicated that cavities obtained were round or slight oval. The diameter was not affected by energy level, however high energy level increased depth and volume of the cavities.

P39

Comparison between photodynamic therapy and a bactericidal solution in the treatment of dental alveolitis microbiological evaluation.

Hayek, R.R.A.; Yamada Júnior, A.M.; Garcez, A.S.; Nuñez, S.C.; Suzuki, L.C.; Ribeiro, M.S..
Mestre em Ciências, IPEN/USP.

Photodynamic therapy is a new therapeutic modality to treat microbial infections. The aim of this pilot study was to compare this new therapeutic approach with chlorhexidine in mini pigs induced alveolitis. Alveolitis is an inflammatory disease that involves the superficial bone layer in the dental alveolus. Eight dental elements were extracted from mini pigs and immediately after the alveolus were contaminated with *Streptococcus aureus*. After seven days the area presented edema and hyperemia. In the chlorhexidine group the alveolus were debrided and irrigated with a 0.12% solution of chlorhexidine. In Laser group the alveolus were debrided and photodynamic therapy was performed consisting in the application of a azulene paste inside the alveolus with a pre-irradiation time of 5 minutes followed by irradiation with a low power diode laser, $\lambda = 685 \text{ nm}$, $P = 50 \text{ mW}$, $E = 9 \text{ J}$, for 3 minutes. Microbiological samples were harvested before and after treatment for both groups with sterile paper points. The results showed bacterial reduction in both groups, although photodynamic therapy was significantly more effective to reduce the population of *S. aureus*. This finding indicates that photodynamic therapy can be an alternative method to the treatment of alveolitis.

P40

Effects of the diode laser irradiation on root surfaces. thermal analysis.

Haypek, P.; Theodoro, L.H.; Bachmann, L.; Eduardo, C. P.; Sampaio, J.E.C.; Zzell, D.M..

Doutoranda em Dentística Restauradora- Faculdade de Odontologia da Universidade de São Paulo-USP.

The purpose of this study was to evaluate the temperature rising

inside the pulpar cavity during the diode laser irradiation on the root surface. Twelve single root teeth were used and their mesial and distal surfaces were irradiated (808 nm, 400 m, 30 s), in a continuous mode (CW) and in a switched mode (SW) (10 Hz). The temperature rise was evaluated depending with the power used (0.4 W to 2.2 W). The temperature was monitored with a thermopar (T) fixed inside de pulpar cavity during the irradiation. In a second step two parameters was used in a SW (10 Hz). The safety temperature was keep using the power: Group A - 0.9 W (mesial) and Group B - 1.08 W (distal). The results showed the thermal pulpar events (T) during the irradiation, based in a specific relation with the power (P), like $T = -0.4 + 3.7P$ in a CW and $T = -0.2 + 2P$ in a SW. The temperature rising during the irradiation was $3.4 \pm 0.4^\circ\text{C}$ on Group A and $4.0 \pm 1.0^\circ\text{C}$ on Group B.

The irradiation mode and the power are much important to temperature rise inside the pulpar cavity and the 0.9 W and 1.08 W radiation on the root surfaces were safety.

P41

Effects of Nd:YAG laser irradiation to fauces.

Hotta, K.; Yamaguchi, H.; Sekine, A.; Kobayashi, K.; Gomi, K.; Arai, T..

Department of Periodontics and Endodontics Tsurumi University School of Dental Medicine. Yokohama, Kanagawa, Japan Aims:

The aim of this study was to evaluate in vivo systemic blood pressure and pulse rate during Nd:YAG laser irradiation of fauces (Mandibular fauces was distributed in glossopharyngeal nerve of *Rr.linuales*: parasympathetic nerve). Material and Methods: The 6 adult volunteers participated in this study. The experimental site for each patient was mandibular fauces. Mandibular fauces area was irradiated with Nd: YAG laser irradiation (30 sec at energy level of 100mJ pulses at 15pulses/sec). The systemic blood pressure and pulse rate were monitored for each patient's throughout the laser irradiation procedure. Results: No significant change in systemic blood pressure and pulse rate were found in laser irradiation of fauces. Discussion and Conclusion: Systemic blood pressure and pulse rate were affected for the irradiation to

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fauces. It was suggested that Nd:YAG laser irradiation for oral cavity is a safe laser device.

P42**Laser in the treatment of temporomandibular disorders - clinical case report.**

Kabbach, W.; Venâncio, R.A.; Oliva, E.A.; Batista, A.U.D.; Rocha, S.S.; Alencar Júnior, F.G.P.

Low Intensity laser therapy is becoming a promising treatment of temporomandibular disorders. As occurs in all therapies, it is extremely important that its principles are well known, as well as the disease presented and the patient who is under treatment, so that it can be properly used and achieve satisfactory results. Two clinical case will be reported, focusing on the importance of diagnosis in the establishment of a proper treatment plan. Operative procedures and well-established doses for the control of etiologic factors and symptomatology of each kind of disorders are 25J/cm², [50mW during 20s per point], in 3 points of ATM and 15J/cm², [20mW during 20s per point], in 2 points of secular muscle, 2 points of muscle to masseter and one point in the interface between the medial and lateral pterigoideo muscle, made in four sections.

P43**Effect of varied pulse energies and pulse repetition rates at the identical total power on enamel ablation using Er:YAG laser.**

Kim, K-S.; Kim, M-E.; Won, J-Y. ; Ahn, S-W..

Background : Tooth ablation by a Er:YAG laser irradiation can be influenced by irradiation parameters. Purpose : This study was performed to investigate the amount of tooth ablation and the change of intrapulpal temperature by Er:YAG laser as it relates to pulse energy and pulse repetition rate at the identical power. Material and Methods : Fifteen extracted human molar teeth were sectioned into two pieces and categorized into three groups within the combination of pulse energy and pulse repetition rate at the same power of 3W; 300mJ-10Hz, 200mJ-15Hz, and 150mJ-20Hz groups. A laser beam with conjunction of water flow rate of 1.6ml/min was applied over enamel surfaces of the specimens during 3 seconds and the ablation amount was determined by difference in weight. Intrapulpal temperature was also investigated. Results : At the identical power of 3W, ablation

amount increased with pulse energy rather than pulse repetition rate. Although intrapulpal temperature increased with pulse repetition rate, there were no significant differences among the groups. Discussion and Conclusion : It is suggested that ablation efficacy is influenced by pulse energy rather than pulse repetition rate, while temperature shows a tendency to be affected somewhat by pulse repetition rate.

P44**Morphological changes and acid resistance in deciduous enamel irradiated with Er:YAG and diode lasers: in vitro study by scanning electronic microscopy**

Joaquim, J.M.; Tanji, E.Y.; Rodrigues, C.R.M.D.; Fonoff, R.D.N..

Estagiária no Centro de Traumatismo em Dentes Decíduos da FOUASP.

The purpose of this study was to evaluate Er:YAG and diode lasers morphological effects and verify the enamel acid resistance increase. Nine deciduous teeth was used cutted longitudinally, parting buccal and lingual surfaces. The teeth were irradiated with Er:YAG (2Hz, 100mJ/pulse, 50 sec) and diode (1W, 15sec) lasers and half of the samples were submitted to pH cycling. The specimens were divided into six groups: Group I-no treatment (control sample); Group II-irradiation with Er:YAG laser; Group III-irradiation with diode laser; Group IV-enamel submitted to pH cycling; Group V-irradiation with Er:YAG and pH cycling and Group VI-irradiation with diode and pH cycling. The samples were evaluated by scanning electron microscopy. The results showed suggestive images of melted and resolidified enamel with diode laser and ablation zones with Er:YAG. After pH cycling, the samples irradiated with diode laser showed increased acid resistance. It follows that laser irradiation promotes significant morphological changes in dental enamel that can modify its acid resistance, and more studies are essential to use this energy in Preventive Dentistry.

P45**Microhardness of the dental enamel surface after irradiation with 960nm diode laser.**

Kohara, E.K.; Wetter, N.U.; Rattichieri, F.; Kato, I.T..
Mestrando do Centro de Lasers e Aplicações do IPEN/USP.

Several authors analyzed laser irradiation of dental enamel in an attempt to increase acid resistance and achieve caries prevention. In some cases, the procedure has also been associated to the application of a layer of fluoride. Micro-hardness measurements are reliable tests used to determine the degree of resistance to demineralization. In this work micro-hardness values of superficial dental enamel have been measured before and after irradiation with a 960 nm diode laser, using tested laser parameters that are safe and cause no injuries to the adjacent tissue. Laser parameters were below the dental enamel ablation threshold. 60 enamel samples were used and divided into control group (GC), fluoride application (GF), laser irradiation (GL), fluoride application with subsequent laser irradiation (GFL) and laser with subsequent fluoride application (GLF). A solution containing coal was used on the enamel surface in order to absorb the laser radiation. A statistically significant loss of the micro-hardness value was obtained for all groups except for GL but also this group did not produce significant micro-hardness increase. Conclusion: at the current peak power and beam quality of standard diode laser bars, safe laser parameters do not produce higher micro-hardness values. Financial support: FAPESP and CNPq.

P46

Effects of 960nm diode laser irradiation and fluoride on calcium solubility of dental enamel in vitro.

Kohara, E.K.; Kato, I.T. ; Wetter. N.U..

Mestrando do Centro de Lasers e Aplicações do IPEN/USP.

The aim of this study is to determine the effects of diode laser (?=960 nm) irradiation on calcium solubility of dental enamel. Sixty enamel specimens were prepared from human teeth and divided into four groups (control, fluoride, laser and fluoride plus laser). Prior to the irradiation a vegetable coal diluted in physiological solution was applied to the enamel surface and the specimens were irradiated using 6,5 W of peak power, 5 ms of pulse duration, 10 Hz of repetition rate, fluency of 3,7 J/cm² and time exposure of 10 seconds. The acidulated phosphate fluoride was applied for 4 minutes. Next, the specimens were immersed in lactic acid for 24 hours at 37 °C. The calcium content in demineralization solution was evaluated with Inductively Coupled Plasma Atomic Emission Spectrometry. The results indicate an increase

in calcium solubility (12%) after laser irradiation, however, not statistically significant. When associated with fluoride, the decrease in calcium solubility did not differ from the results obtained with fluoride only. It can be concluded that in this experiment diode laser irradiation did not increase acid resistance of dental enamel. Financial support: FAPESP and CNPq.

P47

Comparative clinical study of the effect of LLLT in the immediate and late treatments of hypoesthesia due to surgical procedures.

Ladalardo, T.C.C.G.P.; Brugnera Júnior, A.; Pinheiro. A.L.B.; Garrini, A.E.C.; Bolonga, E.D.; Campos, R.A.C..
Doutoranda em Ciências pela UNIFESP - Escola Paulista de Medicina.

We evaluated the effect of LLLT in 68 patients who presented hypoesthesia due to odontological surgery procedures: dental implant surgeries (N=51); extraction of impacted lower third molars (N=10); endodontics in lower first molars (N=7). Lesions treated within 30 days after the nerve injury had occurred were part of the immediate group, and lesions with more than 30 days from the occurrence of the injury were part of the late group. Treatments were carried out with an infrared diode laser of 40 mW - 830nm, continuous wave emission, spot size 3 mm², and a total dosage of 18 joules per session in a contact mode application, 20 sessions altogether. The efficacy of laser therapy in peripheral nerve regeneration is also related to the degree of the peripheral nerve lesion, and not only to the lesion duration. LLLT resulted in neurosensory functional improvement in both immediate and late treatments of hypoesthesia.

P48

Comparative clinical evaluation of the immediate and late analgesic effect of GaAIAs diode lasers of 830 nm and 660nm in treatment of dentine pain.

Ladalardo, T.C.C.G.P. ; Pinheiro, A.L.B. ; Brugnera Júnior, A.; Albernaz, P.L.M. ; Zanin, F.; Campos, R.A.C..
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In this comparative clinical study, we aimed at evaluating the immediate and late analgesic effect of GaAIAs diode lasers of

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660 nm and 830 nm in treatment of dentine pain. We used GaAlAs diode lasers of 660 nm and 830nm with 35 mW, continuous wave emission, spot size 1mm² and a dosage of 4 joules/cm² applied to the cervical dentine surface. In total 4 treatment sessions were performed at intervals of 7 days in a period of 4 consecutive weeks. A total of 40 teeth treated were divided into two groups comprising 20 teeth each: one group irradiated with a 660 nm wavelength laser, and the other one with a 830 nm wavelength laser. By means of a quantitative VAS, we measured the sensitive responses to cold stimulus pre-treatment, and at a follow-up period of 15 and 30 minutes post-treatment in both groups in order to evaluate the immediate analgesic effect. The late effect was evaluated at a follow-up period of 15 and 30 days. Using the GaAlAs diode laser of 660 nm wavelength resulted in better levels of dentine desensitization, at both immediate and late analgesic effect analysis compared with the use of the GaAlAs diode laser of 830 nm wavelength.

P49

A histologic assessment of the low level therapy associated with photosensitizing drug on impaired wound healing in rats.

Lima, M.A.; Theodoro, L.H.; Okamoto, T.; Milanezi, L.A.; Garcia, V.G.

Mestrando em Clinicas Odontológicas, Area de Concentração-Cirurgia Buco-Maxilo-Facial- Universidade de Marília-UNIMAR.

The aim of this study was to histologically assess the effect of low level laser therapy (LLLT) associated with photosensitizing drug on the repair of skin wounds performed on rats dorsum with heat scalpel (HS). Ninety-six rats divided into 4 groups were used: Group 1 (control)- cold scalpel, Group 2 (positive control)- HS; Group 3 (LLLT)- HS followed LLLT; Group 4 (Toluidine-O blue + LLLT) - HS followed Toluidine -O blue and LLLT. In Groups 3 and 4, the laser (685 nm - GaAlAs laser) was applied in continuous mode with 50 mW, in 9 points during 10s, with a total of 90 s (3.375 J/cm²) in contact mode. The results showed that wounds in group 2 presented a delay on the tissue healing while the ones treated with the LLLT or toluidine-O blue and LLLT, the wound tissue healing process was differentiated. The LLLT with toluidine-O blue application promoted more decrease of the inflammatory infiltrated, bigger epithelial differ-

entiation, bigger collagen deposition and decrease of the delay of the wound tissue process. It is concluded the LLLT and photodynamic therapy acted as a biostimulative coadjuvant agents balancing the undesirable effects on the wound tissue healing process.

P50

The biomodulative effect of low level laser therapy on the repair of bone defects submitted to xenografts.

Júnior, F.A.L.; Gerbi, M.E.M.M.; Ramalho, L.M.P.; Marzola, C.; Ponzi, E.C.; Pinheiro, A.L.B..

Doutorando em Laser em Odontologia pela FO-UFBA.

The present study examines the effects of LLLT (Ga-Al-As, 830nm, 40mW, CW, ~0,6mm) on the repair of bone defects on the femur of Wistar albinus rats submitted to organic (OBG) and mineral bovine bone graft (MBG) implantation and guided bone regeneration (Baumer S.A). Five randomized groups were studied: I (control); II (OBBG Gen-ox + Gen-derm Membrane); III (OBBG Gen-ox + Gen-derm Membrane + LLLT); IV (MBBG Gen-ox + Gen-derm Membrane); V (MBBG Gen-ox + Gen-derm Membrane + LLLT). The irradiated groups, received seven irradiations at every 48 hours, being immediately the first after the surgical procedure. The dosimetry was of 16J/cm² per session, divided in four points of 4J/cm² around the defect. The sacrifice periods were of 15, 21 and 30 days. The results demonstrated evidence of a more advanced repair on the irradiated groups when compared to non-irradiated ones. The repair of irradiated groups was characterized by both increased bone formation and amount of collagen fibers around the graft, considering the osteoconductive and osteoinductive action of the xenografts. It is concluded that LLLT associated to organic or mineral bovine bone graft and membrane resulted in positive biomodulative effect on the repair of bone defects.

P51

Optimal Er:YAG laser power for preventing enamel demineralization.

Liu, J.; Hsu, C-Y.; Liu. Y..

Purposes: The purpose of this study was to identify the optimal power range of Er:YAG laser irradiation for prevention of enamel demineralization. Materials and methods: Twenty-one human, non-carious molars were selected. The teeth were covered with

nail varnish, except two 4mmx1mm windows on both buccal and lingual surfaces. The windows were randomly assigned to groups 0,1,2, and 3, receiving no irradiation, 100mJ, 200mJ and 300 mJ irradiation, respectively. Then a two-day pH-cycling was performed, with an 18-hours demineralization followed by a 6-hours of remineralization. Lesion depth was measured using polarized light microscope coupled with an image analysis software. Results: The laser treatments of 100mJ and 200mJ have demonstrated significant protection of demineralization in enamel ($p=0.01$ and 0.001 respectively) but not the treatment with 300mJ. Compared with the control, a lesion reduction of 32.78% and 26.93% for 200mJ group and 100mJ group were obtained respectively. Conclusion: Cavity preparation and caries prevention may be simultaneously performed by Er:YAG laser treatment if the optimal range of laser parameters for laser induced caries prevention can be employed.

P52

Low-intensity laser therapy and functional orthopedics in the treatment of pain from temporomandibular dysfunction.

Lollato, R.F.; Groth, E.B.; Ribeiro, M.S..

Mestre Profissional em Lasers em Odontologia.

Temporomandibular Dysfunction (TMD) is a term used to describe disorders, which involve temporomandibular joint (TMJ), masticatory muscles, and associated structures, isolated or not, whose most frequent symptom is pain. The aim of this study was to evaluate pain and buccal mobility in subjects with CI II malocclusion and TMD symptoms, treated with low-intensity laser therapy (LILT) and functional orthopedics (FO), associated or not. Eighteen subjects were selected and divided into three groups. Group 1 was treated with LILT, $\lambda = 780\text{nm}$, 70 mW, 15 J/cm² per point during two weeks. The application was in three points around the TMJ, and trigger points of masticatory muscles. Group 2 received Planas functional appliances and it was evaluated once a week during two weeks. Group 3 received both treatments at the same time, and the first laser application coincided with the appliance installation. Subjects answered a questionnaire with a score for pain evaluation after palpation. There was pain relief for the 3 groups and no statistical differences were observed among them, however, group 3 showed a remission of pain faster than other groups. This finding indicates the association of the LILT with FO for pain relief in TMD.

P53

Evaluation the effect of Er:YAG laser for non-surgical periodontal disease treatment. A controlled clinical study.

Lopes, B.M.V.; Theodoro, L.H.; Neves, L.H.M.; Marcantonio, R.A.C..

Doutoranda em Periodontia da Faculdade de Odontologia de Araraquara - UNESP.

The aim of the present study was to compare the effectiveness of an Er:YAG laser (2.94 μm), with a combination or not, to that of scaling and root planning (SRP) with hand instruments for non-surgical periodontal treatment. Twenty-one healthy patients with chronic periodontal disease were selected presenting 4 periodontal pockets between 5 and 9mm. The sites were divided randomly in four groups: Group 1: SRP + Er:YAG Laser; Group 2: Er:YAG laser; Group 3: only SRP with hand instruments; Group 4 (control): no treatment. The parameters used for the Er:YAG laser were 100 mJ/pulse and 10 Hz (12.9 J/cm²). Clinical assessments plaque index, gingival index, bleeding on probing, probing depth, gingival resection, and clinical attachment level were made prior to and at 30 and 90 days after the treatment. The results, after 90 days, demonstrated that all treated groups showed a improvement statistics significant ($p<0.05$) on parameters bleeding on probing, probing depth and clinical attachment level. In conclusion, the present results have indicated that an Er:YAG laser, combined or not with SRP with hand instruments, it may represent a suitable alternative for the treatment periodontal, however without additional advantages when compared to the conventional treatment of SRP.

P54

Laser therapy in patient with Cri-Du-Chat syndrome.

Luppi, J. S. S.; Vilela, R.G.; Campos, V.F.; Genovese, W.J.; Santos, M.T.B.R..

Mestranda em Laser pela Universidade Cruzeiro do Sul.

The Cri-Du-Chat syndrome is a chromosomal anomaly caused by the break of the short arm of chromosome 5. The main characteristics of the syndrome are: congenital cardiac and kidney's problems, poor muscle tone, low weight and stature and developmental delay. Patient J.M.S, 12 years old, masculine gender, with medical diag-

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nosis of Cri-Du-Chat syndrome, arrived at the clinic of the Universidade Cruzeiro do Sul presenting injury in the inferior lip. This was the consequence of the traumatic action of the nails of his indicating fingers against the lip. The treatment focused on: Injury: low power laser diode AsGaAl (Dentoflex), red light of wavelength 670nm and energy density of 4J/cm², applied once a week, during four weeks; Etiology: to prevent continuous lip's trauma, the mother was oriented to confection a movement restriction splint to be used in both arms. The result of the laser therapy was extremely positive, presenting significant improvement of the traumatic ulcer since the first reevaluation, one week after the first application. After the fourth application, was observed the cure of the injury. The use of the restriction also had great importance in the treatment, interrupting the repetitive process of trauma.

P55

Advantages in using the CO₂ and Nd:YAG lasers in frenectomy.

Malta, D.A.M.P.; Barbosa, C.A.; Amaral, A.L.C.; Fontana, C.R..

One of the most ordinary applications of CO₂ and Nd:YAG lasers in dentistry is frenectomy. The advantages of using this kind of surgical lasers to remove abnormal frenum are presented at two case reports. The Nd:YAG laser was used for an upper labial frenum surgery while the CO₂ laser was used for a lingual frenectomy. The Nd:YAG laser surgery was applied with 2,75W-75Hz at the beginning and with 4,0W-50Hz at the end of surgery. The CO₂ laser was used with 2,0W-80Hz during all the surgical procedure. After that, a diode laser (GaAlAs-660 nm) of low intensity was used in order to stimulate the healing. The energy density applied was approximately 4 J/cm² per point of application. The advantages of frenectomy with CO₂ and Nd:YAG lasers are lack of hemorrhage, no suturing or packing and mechanical trauma, minimal time spent to perform the procedure, sterilization of the surgical area, minimal post operative discomfort, and, only for the CO₂ laser, a noncontact surgery to the tissues. The CO₂ and Nd:YAG lasers must be used as usual as it is possible, therefore, in comparison to the conventional procedure, the using of this devices in frenectomy carries many advantages for the patients.

P56

LLLT application in lip injury: a case report .

Marchesan, M. ; Silva, R.J.; Brugnara Júnior, A.; Neto, M.D.S.; Marchezan, W.G.

Centro de Laser da UNAERP - Ribeirão Preto - SP.

This clinical case reports a wound that occurred due to the heating of the lip with low-speed rotation during a bone graft surgery for the future placement of an implant in the anterior region of the maxilla. The patient was seen at the clinic after two weeks and presented extreme pain and could not eat or drink anything for one week. The treatment was carried out with a 50 mW diode laser (630 nm wavelength), with continuous emission, a 3 mm spot size and 10 J of total energy per session. We used a verbal scale (VAS) to measure intensity of the sensitive response before and after the treatment. The treatment consisted in a 3 weekly session (every 48 h) during 2 consecutive weeks. Immediately after the first application the patient presented pain relief and could already perform normal eating and drinking activities. In two weeks the wound was healed and the patient was instructed to perform massages with lanolin cream to reduce the fibrosis of the scar tissue.

P57

Intracoronary bleaching of discolored non-vital teeth using laser radiation: a case report.

Marchesan, M.; Castro, F.C.; Matarazzo, A.T.; Pécora, J.D.; Zanin, F., Brugnara Júnior, A..

FORP-USP Centro de Laser - Laboratório de Endodontia.

Dissemination of blood into the dentinal tubules caused by pulp extirpation or traumatically induced internal pulp bleeding is a possible cause of discoloration of non-vital teeth. Discolored teeth, especially in the anterior region, can result in considerable cosmetic impairment. The whitening of these teeth is an alternative therapeutic method that is relatively non-invasive and conserves dental hard tissue. Recently, intracoronary bleaching of pulpless discolored teeth can be performed with the association of laser irradiation to hydrogen and carbamide peroxide and can even be accomplished in one session. This report shows a clinical case of an endodontically treated tooth submitted to bleaching using LED light and infrared LLLT therapy.

P58

Effect of 830nm laser light on the repair of bone defects grafted with bovine decalcified

cortical osseus membrane.

Marques, A. M.C.; Gerbi, M.E.M.; Limeira Júnior, F.A.; Ramalho, L.M.P.; Ponzi, E.A.C.; Pinheiro, A.L.B..

Doutoranda de Laser em Odontologia - UFBA.

The aim of the present investigation was to assess histologically the effect of LLLT (AsGaAl, 830nm, 40mW, CW, f ~0,6mm) on the repair of surgical defects created in the femur of the Wistar rat. The defects were filled to bovine biological membrane (GTR). Surgical bone defects were created in n=48 divided into four groups: Group I (control - n=12); Group II (Laser - n=12); Group III (Membrane - n=12); Group IV (Membrane + Laser - n=12). The animals on the irradiated groups received 16J/cm² per session divided into four points around the defect (4J/cm²) being the first irradiation immediately after surgery and repeated seven times at every 48h. The animals were humanely killed after 15, 21 and 30 days. The results of the present investigation showed histological evidence of improved amount of collagen fibers at early stages of the bone healing (15 days) and increased amount of well organized bone trabeculae at the end of the experimental period (30 days) on irradiated animals compared to non irradiated ones. It is concluded that a positive biomodulative effect on the healing process of defects associated to the use of biological membrane on the femur the rat.

P59

Effect of 685nm laser irradiation on the cell proliferation of Candida parapsilosis. Study in vitro.

Marques, A. M.C. ; Gerbi, M.E.M; Limeira Júnior, F.A.; Moreira, A.C.A.; Santos, J.N.; Pinheiro, A.L.B.. Doutoranda do Programa Integrado de Pós-Graduação Laser na Odontologia - UFPB/UFBA.

The aim of this study was to evaluate in vitro, the cell proliferation of *Candida parapsilosis* after laser irradiation (As GaAl, 685nm, 25mW, CW, Ø= 0,6nm), through the use of spectrophotometry (600nm) and the optical microscopy. The sample *C. parapsilosis* was cultivated in a solid Sabouraud environment at 28° C. After twenty-four hours, 2 ml of the specimen was removed and kept into 12 test tubes and divided into four groups. Experimental groups were treated with laser and the following doses were applied: GI 6J/cm², GII 8J/cm², GIII 10 J/cm² and the control group. The spectrophotometry analysis after 48 hours showed that at G III (10 J/cm²) a lower percentage of optical

density. The results obtained after 48 hours showed: GC- cells were spreaded and presented a large size; GI- cells were both aggregated and also isolated; GII, most cells were aggregated but also could be found isolated; GIII, cells were much more aggregated. In this present study the laser irradiation interfered with the cell multiplication process, and that the dose of 10 J/cm² promoted higher aggregation of cells and a lower percentage of optical density of *Candida parapsilosis*.

P60

Tensile strength of adhesive systems to primary dentin treated by Er:YAG laser and conventional high-speed drill.

Marques, B.A. ; Navarro, R.S.; Pinheiro, S.L.; Oda, M.. Estagiária em Odontopediatria pela USP-SP.

The aim of this study was to evaluate tensile strength of different adhesive systems to primary teeth dentin prepared by high-speed drill and Er:YAG laser (2.94µm). Buccal surfaces of 38 primary canines (Banco Dentes Humanos-FOUSP) were grounded and flattened with sand paper disks (#120-600 grit) and distributed into five groups (n=15): G1: diamond bur in high-speed drill (HD)+ 35% phosphoric acid (PA)+Single Bond (SB); G2: HD+self-etching One Up Bond F (OUB); G3: Er:YAG laser (KaVo 3- LELO-FOUSP)(4Hz, 80mJ, 25,72J/cm²) (L)+PA+SB, G4: L+SB, G5: L+OUB. The inverted truncated cone samples built in Z-100 composite resin after storage in water (37°C/24h) were submitted to tensile bond strength test on Mini Instron 4442 (0.5mm/min, 500N). The data were analyzed with ANOVA and Tukey Test (p<0.05). The mean (MPa) were: G1- 3.18(±1.24); G2-1.79(±0.73); G3-3.17(±0.44); G4-8.29(±1.86); G5- 7.11(±2.07). The data analyzed with ANOVA and Tukey Test showed that Laser associated with PA+SB, SB or OUB lead to increase of bonding values in comparing to HD+PA+SB and HD+OUB (p=0.000), L+SB showed higher values than L+PA+SB and L+OUB (p=0.0311). The Er:YAG laser radiation promoting significant increase of bond strength of different adhesive systems evaluated in dentin of primary teeth.

P61

Use of CO2 laser in Melanin pigmentation: a case report.

Marinho, C.A.; Souza, R.M.; Martins Júnior, W.; Brugnera Júnior, A.; Marchezan, M.A..

Poster Presentation

Centro de Laser - Unaerp

This clinical case reports a case of melanin pigmentation in the oral mucosa in a 20 year old patient that was compromised aesthetically. Carbon dioxide laser vaporization of the gingiva of the maxillary and mandibular sites was performed. Crown increase of both maxillary lateral incisors regularizing the gingival morphology was also performed favoring an aesthetic smile. The patient was controlled periodontally and differential diagnosis of blue-black lesions was performed. Normal distribution of the pigments in the gingiva and no involvement of the re-epithelium mucosa. Removal of melanin sites was performed with CO2 laser in the following parameters: 4.5 W and continuous-wave length. No anesthesia was used and the patient did not refer any pain during the procedure. To prevent recurrence of the pigmentation, the area must be cleared completely from melanin discoloration, directing the laser beam carefully along the visible margins of the area.

P62

Superficial roughness of a composite resin light cured by halogen light and LED bleached with two agents.

Mattos, A.D.S.; Pinheiro, A.L.B.; Motta, C.V.B.; Santana, E.J.B.; Costa, L.; Bezerra, R.B..

Doutoranda em lasers na odontologia (UFBA).

The purpose of this in vitro study was to evaluate of superficial roughness of a composite resin light cured with different sources and bleached with two agents. Sixty samples of composite resin (RC) Z-250/3M-Espe were prepared (6 groups, n=10). The groups A, B and C were light cured by halogen light-LH (Optlight-600/Gnatus) and D, E and F by LED (Ultrablue IV/DMC), both for 20 seconds. The samples were polished with discs (Sof-Lex/3M) and bleached, in accord to: GA- RC (control of LH); GB- RC bleached with 10% carbamide peroxide-PC (Whiteness Perfect/FGM) for 88 hours; GC-RC bleached with 35% peroxide hydrogen-PH (Whiteness-HP/FGM) activated by LED (twice with two applications each one); GD- RC (control of LED); GE- RC bleached with PC as in group B and GF- RC bleached with PH as group C. Using a roughness tester (Mitutoyo), was obtained the following results (mean in Ra): GA(0,41±0,06); GB(0,49 ± 0,06); GC(0,49±0,06); GD(0,45±0,06); GE(0,41±0,06) and GF (0,52± 0,08). ANOVA, p<0,05 and Tukey test. It was concluded that when the samples were

light cured by LED the 35% peroxide hydrogen promoted a statistically significant increase in the superficial roughness of the samples when compared with the 10% carbamide peroxide.

P63

Effect of the polishing after the bleaching in the superficial roughness of a composite resin bleached with two agents.

Mattos, A.D.S.; Pinheiro, A.L.B.; Santana, E.J.B.; Souto, C.C.; Bezerra, R.B..

Doutoranda em lasers na odontologia (UFBA).

This in vitro study evaluated the effect of the polishing after bleaching on the superficial roughness of a composite resin (RC)-250 (3M-Espe), light cured by LED (Ultra blue IV/DMC), and bleached with two materials: 10% carbamide peroxide- PC (Whiteness-Perfect/FGM) for 88 hours and 35% peroxide hydrogen- PH (Whiteness-HP/FGM), activated by LED. Then, the samples were polished by felt discs and paste (Diamond-R / FGM). It were fabricated 60 samples of composite resin (6 groups, n =10).GA- RC light cured; GB- RC light cured and polished; GC- RC light cured and bleached by PC; GD- RC light cured and bleached by PC and polished; GE- RC light cured and bleached by PH and GF- RC light cured and bleached by PH and polished. Thus, the samples were tested by the roughness tester (Mitutoyo).Were obtained the following results (mean in Ra): GA(0,045 ± 0,06); GB(0,39 ± 0,03); GC(0,41 ± 0,08); GD(0,05 ± 0,07); GE(0,52 ± 0,07) and GF(0,53 ± 0,08). ANOVA p>0,05 and Tukey test. It was concluded that the bleaching agents increased statistically significant the superficial roughness of the samples when the polishing was done. The PH showed more roughness compared to PC without the polishing.

P64

Cutaneous wounds repair in rats after lasertherapy of 635nm and polarized light 400nm to 2000nm: Comparative study.

Meireles, G.C.S.; Vieira, A.L.B.; Almeida, D; Noia; M.P.; Santos, J.N. ; Pinheiro,A.L.B..

Doutoranda em Laser EM Odontologia - UFBA - Bahia.

This work aimed to evaluate histologically the differences on the healing of cutaneous wounds on rats following Lasertherapy (635nm) or illumination by polarized light (400-2000nm). Twenty five Wistar rats had a standardized wound created on the dorsum

and were divided into five groups: G1 Control; G2 Lasertherapy (635nm; 20J/cm²); G3 Lasertherapy (635nm;40J/cm²); G4 Bioptron® (400-2000nm; 20J/cm²); G5 Bioptron® (400-2000nm; 40J/cm²). Each group contained five animals. The first application of the treatment was carried out immediately and repeated at every 24 hours during seven days. The specimen were taken and routinely processed to wax, cut and stained with H&E and PICROSÍRIUS stains and analyzed under light microscopy. The analysis included: re-epithelization; inflammatory infiltrate and fibroblastic proliferation. PICROSÍRIUS stained slides were used perform descriptive analysis of the collagen fibers. The results showed that the group of the light polarized in the dose of 20J/cm² had better results than the group laser, and that the laser in the two dosagens was better than the group controls. It is concluded that both fototerapia modalities presented positive biomodulation contributing like this to a better repair of wounds. Financial support: PIBIC/UFBA.

P65

Comparative clinical study of laser treatment versus fluoridization in dentin hypersensitivity.

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Head of Department of Oral Rehabilitation & Dental Emergencies.

Purpose: The etiology of dentine hypersensitivity is multi-factorial. Presently, there are a great number of methods and different agents in use for treating dentine hypersensitivity, but an efficient long-term treatment has not yet been obtained. The aim of this study was to compare the efficiency of the three therapeutic lasers (CO₂, GaAlAs diode, Nd:YAG) in the treatment of hypersensitivity.

Materials and methods: The study group consisted of 72 patients (aged 19 to 35), with at least four teeth affected by hypersensitivity. The sensitivity degree to cold, cool air and tactile stimuli, for each tested tooth and for the control groups, was determined 24 hours before treatment. Therapeutic methods used: fluoridization, laser treatment, and a combination between laser and fluoridization. Laser devices used: CO₂ LX-20 Nova Pulse (10600 nm; 2-10W); GaAlAs diode IRRADIA (830nm; 30mW) and Nd:YAG American Dental Laser (1064 nm; 3W). The response to treatment was recorded 24 hours after the end of the treatment, and one, two and three months later. The significance of results was evaluated using Student's t-test, and the threshold of 0.05 (P<0.05) was considered of minimum significance.

Results: In 90% of teeth, where only laser was applied, the most

efficient laser was CO₂. The results show the maximum efficiency of the combined therapy (GaAlAs laser and fluoridization) in 98% of cases, in all three tested sensitivity methods.

Conclusions: Laser irradiation of dentin produced a significant reduction in the pain level to all tested stimuli in comparison with fluoridization, which was efficient only for the tactile ones.

P66

Use of OSADA LIGHTSURGE 3000 for Temporomandibular Disorder

Mizoguchi, T.; Tsuda, T..

Introduction: We irradiated the sore oral areas of a temporomandibular disorder patient with laser to alleviate the pains of jaw movement, tenderness, and spontaneous pains and improve the bloodstream, which has produced the desired therapeutic effect. Here is the postoperative progress which the neurometer used for tracing the irradiated areas has exhibited. Methods: The patient is a 24-year-old female diagnosed with temporomandibular disorder. We asked her to locate two sore oral areas and determined where to irradiate using a neurometer, and then irradiated the each area with 0.4-W continuous wave of laser for 90 seconds. We asked her to visit us four times at intervals of approximately one week and evaluated her preoperative and postoperative symptoms using PAS (Pain Analog Scale) each time she visited us. Results: Her pains have been almost eliminated after the four visits. The evaluation for the four weeks showed effectiveness. Summary: The neurometer helped us objectively determine where to irradiate. We have successfully improved the symptoms through a repeated short-time irradiation with laser.

P67

Tensile bond strength of flowable composite to dentin surface treated by Er:YAG laser radiation.

Moura, J.D.; Soares, S.G.; Navarro, R.; Eduardo, C.P..

Laboratório Especial de Laser em Odontologia LELO-FOUSP.

The aim of this in vitro study was to evaluate the influence of flowable composite on tensile bond strength to dentin surface treated by Er:YAG laser radiation (2.94µm) and diamond bur with high-speed drill. Sixty dentin surfaces of thirty human molars, divided in 6 groups G1 HD, G2 HD + FC, G3 L 100mJ/10Hz, G4 L 100mJ/10Hz + FC, G5 L 250mJ/2Hz, G6

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250mJ/2Hz + FC. After treatment with phosphoric acid etching 15s and adhesive system Excite, inverted conical specimens were prepared with Tetric Ceram composite in 3 increments, photo-cured for 40s each, using or not previously FC Tetric Flow. After storage in distilled water (37 °C-24 h) was performed the tensile test using an universal testing machine Mini Instron 4442. The mean bond strength values MPa were G1-13.54(±2.99); G2-14.67(±2.32); G3-9.49(±3.09); G4-14.60(±2.76); G5-8.97(±3.89); G6-13.02(±2.18). The data obtained were submitted to Kruskal Wallis test (p=0,01). It can be concluded that high-speed drill treated surfaces showed statistically no influence of flowable composite, higher bond values than laser treated surface without flowable composite and similar effectiveness than laser surface with flowable composite; the flowable composite showed significant increase of bond values on surface treated by Er:YAG laser radiation with different energy parameters.

P68

Influence on the apical marginal permeability after laser irradiation with two wavelengths associated with two Endodontics cements.

Moura, A.A.M.; Carvalho, C.F.; Antoniazzi, J.H.; Eduardo, C.P.; Moura Neto, C..

Professor Livre Docente, Associado da Disciplina de Endodontia da FOUSP.

The in vitro study aims to evaluate, quantitatively and qualitatively, the Nd:YAG and Diode laser irradiations having the EDTA-T irrigation as a reference on the root canal apical sealing when made previously to the root canal filling with two resin cements (AH Plus and Endo REZ). Qualitative and quantitative analyses were based respectively on the blue methylene apical marginal linear infiltration readings and on the morphological aspects readings of the cement adaptation on the apical region walls through SEM images. The apical marginal infiltration reading results after the analysis of variance and Tukey's test showed statistical significant differences among the treatment types of the root canal walls independently from root canal filling cement used. The cements are significant different among themselves regardless the kind of treatment on the root canal walls. When the experimental group interactions were analyzed could be seen that the root canal filling cements did not present statistical significant differences when the root canal walls were treated with EDTA-T. The SEM analysis revealed a better AH Plus cement adaptation for the Nd:YAG laser irradiated root canal walls confirming

the microleakage results. The best results were achieved with the Nd:YAG laser irradiation associated to the AH Plus cement.

P69

Local Treatment using high and low-power laser on herpes simplex.

Müller, K.P.; Yamada Júnior, A.M.; Sugayama, S.T.; Ribeiro, M.S..

Mestranda em Ciências, IPEN/USP.

Herpes simplex (HSV) is commonly encountered in the dentistry practice disappearing after 10 to 14 days. Recently alternative treatments have been introduced, among those laser therapy. The aim of this study is to evaluate the efficacy of laser therapy in patients with perioral herpes simplex infection. A 32 years old female was treated with high-intensity laser therapy (HILT) in vesicle phase using a Nd:YAG laser, $\lambda = 1064 \text{ nm}$, $P = 1,5 \text{ W}$, $f = 15 \text{ Hz}$ on days 1 and 2 to drainage the vesicles. Low-intensity laser therapy (LILT) was applied on the affected area in the 3 consecutive days with a GaAlAs laser, $\lambda = 830 \text{ nm}$, $D = 5 \text{ J/cm}^2$. On the other hand, a 7 years male patient, which presented the vesiculo-ulcerative stage, only LILT ($\lambda = 660 \text{ nm}$, $D = 4 \text{ J/cm}^2$) was carried out. For both cases, it was observed that the course of the infection was quicker than the normal. Seven days after treatment beginning the lesions were healed. These findings suggest that LILT associated or not to HILT is a efficient and promising treatment for HSV. Further larger studies aiming at confirming these data and investigating the LILT mechanisms of action should be performed.

P70

Effects of the low-intensity red laser radiation on the fluoride uptake in human enamel. A preliminary study.

Nakasone, R.K.; Rodrigues, C.R.M.D.; Buzalaf, M.A.R.; Olympo, K.P.K.; Tanji, E.Y.; Ribeiro, M.S..

Mestre Profissional em Laser em Odontologia.

Fluoride has been the most important preventive method on development of the caries. This in vivo study evaluated the effects of low-intensity red laser radiation on the fluoride uptake in enamel. Ten healthy participants were recruited for this study. The two upper central incisors of each volunteer were used and divided into 4 groups: group GC (control), which was untreated; group GF (fluoride), which received topical acidulated phosphate fluoride (APF) 1,23% treatment for 4 minutes; group GLF (laser + fluoride), which was irradiated with a low-intensity diode laser ($\lambda = 660 \text{ nm}$ and

dose= 6 J/cm²) with APF application after irradiation and group GFL (fluoride + laser), which received APF before irradiation using the same parameters as GLF. The determination of fluoride was performed using a fluoride ion electrode after an acid-etch enamel biopsy. The results showed a significant increase of the fluoride uptake in enamel for groups GF, GLF and GFL when compared to control group. Although a percentage increase of 57% was observed for GLF with respect to GF, there were no statistical differences among the treated groups. These findings motivate further studies in order to introduce low-power laser associated to APF as a protective method of dental caries.

P71

Morphological analysis of cavities preparations performed by Er:YAG laser using different parameters.

Navarro, R.S.; Freitas, P.; Almeida, J.; Imparato, J.C.P.; Eduardo, C.P.

Doutorando em Odontopediatria da FOU SP.

The purpose of this study was to evaluate morphological changes in cavities performed by Er:YAG laser (2.94µm)(KaVo KEY 3)(LELO-FOUSP) and high-speed drill. In buccal and lingual surfaces of 27 human molars (Banco de Dentes-FOUSP) were performed cavities using different laser parameters (n=3): G1-15Hz/160mJ enamel/6Hz/200mJ dentin; G2-15Hz/180mJ enamel/6Hz/200mJ dentin; G3-15Hz/160mJ enamel/6Hz/250mJ dentin; G4-15Hz/180mJ enamel/6Hz/250mJ dentin; G5-15Hz/180mJ enamel/10Hz/180mJ dentin; G6-15Hz/160mJ enamel/10Hz/180mJ dentin; G7-15Hz/160mJ enamel/10Hz/160mJ dentin; G8-15Hz/180mJ enamel/10Hz/160mJ dentin and G9-high-speed drill. Samples were fixated (2.5% glutaraldehyde, 12h, 4°C), dehydrated (25-100% ethanol), dried to a critical point and sputter-coated with gold for analysis under SEM. All laser parameters used demonstrated no evidence of thermal damage and signs of burning, cracks and melting, Er:YAG laser ablated dental hard tissues, with exhibition of enamel rods, like scales, dentin surface without smear layer and dentinal tubules opened. Conclude that Er:YAG laser parameters were effective on ablation of hard tissues, promoting morphological changes on irradiated tissues, creating irregular and microretentive morphological pattern.

P72

Comparative study of the microhardness and

curing depth of composite resin with halogen lamp and argon laser.

Noya, M.S.; Zumaêta, G., Miranda, C.B.; Brugnera Júnior, A.; Zanin, F.; Pinheiro, A.L.B..

Curso de Doutorado - UFBA - Bahia.

The aim of this study was to conduct an in vitro comparison of the Vickers microhardness on the surface at 2 and 4mm of depth after curing of a posterior composite resin (P60 - 3M) by utilization of halogen lamp and argon laser at a wavelength of $\lambda = 488$ nm. Ninety specimens were employed, with two metallic matrix bands measuring 6mm in diameter and 2mm or 4mm in height. Curing of the specimens was conducted with a halogen lamp (400mW/cm²) on the specimen surface, by means of the conventional and soft-start techniques. Conventional light-curing was performed for 20 seconds. Soft-start curing was carried out for initial five seconds at a light intensity of 200mW/cm², followed by a 1-minute interval and further 15 seconds of light-curing at 400mW/cm². As to the argon laser, curing was performed on the specimen surface for 10 seconds at an intensity of 250mW/cm². The specimens were submitted to reading of Vickers hardness on a microhardness tester (FGM Microhardness Tester), on which every test surface underwent three indentations with a 50-g load for 30 seconds, being the result represented by the mean of the three hardness measurements achieved. Just the soft-start curing group at 4mm exhibited a lower mean microhardness, which was quite different from that found for the other groups. The mean microhardness measurements on the surface of the specimens were also higher than those achieved at 2mm, with the highest mean hardness of the specimen by utilization of the soft-start technique. The argon laser revealed a statistically similar hardness on the specimen surface when compared to the discontinuous mode at 2mm of depth, with just 10 seconds of light-curing. The results achieved were submitted to statistical analysis by the parametric technique of analysis of variance (ANOVA) at a significance level of 5%, which demonstrated that microhardness was decreased with the increase in depth, regardless of the light source and curing technique employed. The argon laser displayed a lower mean microhardness compared to the halogen lamp.

P73

Clinical evaluation of the immediate effectiveness of gaaias laser on the therapy of dentin

 Poster Presentation

hypersensitivity.

Noya, M.S.; Bezerra, R.B.; Lopes, J.L.; Brugnera Júnior, A.; Zanin, F.; Pinheiro, A.L.B..

Curso de Doutorado - UFBA - Bahia.

The aim of the present study was to determine the effectiveness of GaAlAs laser therapy with 670nm laser on the treatment of dentin hypersensitivity. Thirty-two intact human teeth were evaluated, the sensitivity of which to thermal (cold water), mechanical (probe) and evaporative (air) stimuli was recorded before and immediately after irradiation. Whenever desensitization was not observed after the first application, the patient was scheduled for a maximum of three further applications at 4-day intervals. The results demonstrated that laser therapy yielded a statistically significant reduction ($p < 0.05$) in dentine hypersensitivity to the three stimuli analyzed. The thermal and mechanical stimuli required just one application, whereas the evaporative stimulation demanded at least two applications of laser for the achievement of a similar effect.

P74**Action of the diodo laser (670nm/50mW) in cariogenic oral bacteria culture: An in vitro study.**

Nunes, J.M. ; Jacobs, M.M.. Especialista em Dentística pela FOUSP.

Action of the Diodo LASER (670nm/50mW) in Cariogenic Oral Bacteria Culture: An In Vitro Study NUNES, J. M.; JACOBS, M. M. PhD. Purpose: The antimicrobial activity of the Diodo laser (670nm/50mW) was evaluated in vitro on the cariogenic oral bacteria. Materials and Methods: Various power settings and times of exposure were used at a fixed distance of 1 cm. The cultures of cariogenic oral bacteria were irradiated, sowed, and incubated, and bacterial colonies in the irradiated group were counted. Nonirradiated controls were analyzed following the same procedure. Results: Bacterial inhibition was found in all lased groups. Conclusion: The bactericidal efficacy reported here comparable to the results of other in vitro studies. Irradiation of cariogenic oral bacteria with the Diodo laser (670nm/50mW) offers the promise of future implementation in preventive dentistry.

P75**Effect of new dentin cavity preparation technologies on microtensile bond strength to dentin using different adhesive systems.**

Oliveira, M.T.; Freitas, P.M.; Eduardo, C.P.; Giannini, M..
Dentística Restauradora - UNICAMP/USP

This study evaluated the effect of dentin cavity preparation technologies on microtensile bond strength to dentin, using self-etching adhesive systems (Clearfil SE Bond - Kuraray (SE) / Tyrian - Bisco (TY) / Unifil - GC Corp (UN)) and a total etch adhesive system (Single Bond - 3M ESPE (SB)). Third molars with occlusal dentin flattened were treated with air abrasion (AA), CVD-diamond sonoabrasion (SA) and Er:YAG laser (200mJ/4Hz) (LA). Twelve experimental groups were established ($n=4$): G1-SE-AA, G2-SE-SA, G3-SE-LA, G4-TY-AA, G5-TY-SA, G6-TY-LA, G7-UN-AA, G8-UN-SA, G9-UN-LA, G10-SB-AA, G11-SB-SA, G12-SB-LA. Following surface treatments, adhesive systems were applied according to manufacturer's instructions and 5mm blocks high were built with Clearfil AP-X (Kuraray) composite. Teeth were stored for 24h in distilled water and trimmed to beams shape of approximately 0.8mm². The beams were tested in tension (0.5mm/min - Instron 4411) and results were analyzed with ANOVA and Tukey's Test ($p < 0.05$). It was found an interaction between adhesive systems and surface treatments (MPa): G1-27.39±7.14Aa, G2-15.46±5.72Ab, G3-14.15±6.05Ab, G4-22.56±5.91Aa, G5-13.99±5.06Aa, G6-15.34±5.32Aa, G7-32.88±8.88Aa, G8-15.56±7.09Ab, G9-12.41±5.68Ab, G10-30.17±5.71Aa, G11-20.95±4.98Ab, G12-13.82±4.98Ac.

The results showed that the cavity preparation technology can influence the microtensile bond strength to dentin for the tested adhesive systems, except for Tyrian.

P76**The root canal disinfection with laser Nd:YAG. Related Case.**

Pagnoncelli, R.M.; Cotta, E.S.; Hofmann, C.S.; Ghisi, A.C.; Pagnoncelli, R.M..

Professor Doutor do Programa de Pós-Graduação em Cirurgia e Traumatologia Bucocomaxilofacial pela Pontifícia Universidade Católica do rio Grande do Sul (PUCRS) .

The roots canal system disinfection is one of the most important part of successful edontotic therapy. The shape of root canal is responsible for disinfection through the quimical substance activities are needed to eliminated the microorganisms, which can produce an inflammation or even the therapy loss. Due to the

importance of root canal disinfection, many studies research a form of obtaining the fastest and efficient way of reaching that aim to disinfection of the root canal. According to MOSHONOV (1995) the laser therapy in root canal in vitro teeth showed improvements conventionally in relation the shape of the root canal. In spite of the decrease of the number of bacteria, the use of the laser still needs to be proven as efficient. It was based on that statement that the laser Nd:Yag was used in a clinical case, telling the procedure and the postoperative of the patient.

P77

Biomodulation with low-level laser (830nm) in surgically assisted rapid maxillary expansion.

Pagnoncelli, R.M.; Viegas, V.N.; Abreu, M.E.R.; Mezzomo, L.A.; Prietto, L.; Pagnoncelli, R.M. Doutor em CTBMF.

The low-level laser therapy (LLLT) is a utility coadjutant in the treatment of patients with maxillary atresia, submitted to surgically assisted rapid maxillary expansion.

We pretend report clinical cases, in which GaAlAs laser (830nm) was utilized to optimize this surgical treatment. These cases are parts of study realized at Dental School, Laser Center (PUCRS). Eight laser applications were realized, during the activation of Haas expander, with subsequent protocol: infrared laser, 40mW, 100Hz and 12 J/cm² distributed in eight points.

In the treatment end was obtained excellent cicatricial aspect and swelling absence. The patients reported pain decrease during Haas activation period. An excellent gingival healing was verified.

The Low-level laser therapy is a useful tool in treatment of patients submitted to orthognathic surgery to correct transverse maxillary deficiency.

P78

CO2 laser: Excellence in tumor enucleation from lingual floor.

Alfredo, E., Pádua, J.M., Vicentini, E.L., Marchesan, M., Sousa Neto, M.D.

Centro de Laser da Universidade de Ribeirão Preto, UNAERP, Ribeirão Preto, SP, Brazil.

Treatment of tumors in the lingual floor present surgical difficulties due to abundant bleeding and, under local anesthesia, lingual movement and the oropharyngeal reflex (nausea) are affected, hindering

conventional surgical manipulation. High intensity laser treatment is an alternative because it allows lesion enucleation with safety margins, almost no bleeding and the use of a small quantity of anesthetic solution, leading to a more comfortable and quicker post-operative period. Therefore, this clinical study evaluated these trans- and post-operative actions during soft tissue tumor enucleation located at the right posterior region of the lingual floor adhered to the inner region of the mandibular angle, using the OPUS-20 CO₂ laser (ECS/Sharplan Medical System) at the following parameters: 10.6 µm wavelength, 8 W, continuous emission, straight and curved hand pieces and non-focussed emission mode (2 mm focus). The laser was applied perpendicularly to the tissue, opening an elliptical area. After removal, the margins were vaporized molding the area and the histological diagnosis was high level pleomorphic sarcoma. Surgical lasers offer a successful alternative for treatment of soft tissue lesions with minimal postoperative trauma, pain, edema and aids the natural healing process benefiting both the professional and the patient.

P79

A 3 year follow-up of internal tooth bleaching with blue LED and laser application.

Zanin, V., Marchesan, M., Brugnera Júnior, A., Zanin, F.

Instituto Brugnera e Zanin-São Paulo-SP

This study evaluated the effect and efficacy of photo-assisted internal tooth bleaching during and after the procedure. Thirty maxillary incisors and canines treated endodontically were evaluated clinically and radiographically and bleached with a conjugated Blue LED (8 LEDs, 567nm, 57mW) and central diode laser (790nm, 40mW) with a 1.4cm diameter tip according to the protocol of the manufacturer (Brightness, Kondortech, São Carlos, Brazil): gel activation during 30 s up to 6 times. The gel was 35% hydrogen peroxide of two commercial brands: 15 cases Whiteness HP and 15 cases a manipulated gel (Fórmula e Ação), both with specific red pigments to interact with the blue light from the LED. There was no clinical difference between the final results using the different products. The results show that in all cases the tooth color was recovered with no side effects such as sensitivity, cracks or inflammatory reactions of the gum or periodontal ligament. The patients were fol-

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lowed up every six months for three years and the color and health of the teeth were maintained. The technique was efficient in recovery of tooth color and no side effects were observed in any case.

P80

Effect of instrumentation with different irrigating solutions and with or without Er:YAG laser irradiation on radicular dentine permeability

Pécora, J.D. ; Ribeiro, R.G.; Marchezan, M.A.; Brugnera Júnior, A..

Laboratório de Endodontia da FORP-USP.

This study evaluated radicular dentine permeability of root canal walls when using different irrigating solutions associated or not with Er:YAG laser. Fifty human maxillary incisors, obtained from laboratory stock, were randomly divided into ten groups of five teeth each. External surfaces of the teeth were impermeabilized with cyanoacrylate (Super Bonder). After chamber access, the root canals were instrumented with the step-back technique. Ten ml of irrigating solution was used in each root canal. Group I: irrigated with distilled and deionized water; Group II: irrigated as Group I and irradiated with laser; Group III: irrigated with 0.1% laurel diethyleneglycol ether sodium sulfate; Group IV: irrigated as Group III and irradiated with laser; Group V: irrigated with 1% sodium hypochlorite; Group VI: irrigated as Group V and irradiated with laser; Group VII: irrigated with 15% EDTA; Group VIII: irrigated as Group VII and irradiated with laser; Group IX: irrigated with 10% citric acid; Group X: irrigated as Group IX and irradiated with laser. Laser (KaVo Key Laser II) was applied with the following parameters: 15 Hz, 300 pulses, 42 J total energy, and 140 mJ input and 51 mJ output. The fiber optic tip was introduced until the apex and the laser was activated. The tip was withdrawn gently with helicoidally movement from the apex until the cervical portion. After preparation of the root canals, the roots were immersed in 10% copper sulfate for 30 minutes and then immersed in 1% rubeanic acid alcohol solution for the same period. The roots were sectioned transversally into 150- μ m slices, sanded, washed, dehydrated, cleared and mounted on glass slides for microscopic examination. The quantification of the penetration of copper ions was done by morphometric analysis. Results showed that distilled and deionized water + laser and 1% sodium hypochlorite presented the highest dentine permeability ($p>0.05$) and was statistically different

from the other groups ($p<0.05$). The use of 0.1% laurel diethyleneglycol ether sodium sulfate and distilled and deionized water showed less of an increase in dentine permeability than the other studied solutions and were statistically similar. One percent sodium hypochlorite + laser, EDTA + laser, citric acid + laser, 0.1% laurel diethyleneglycol ether sodium sulfate + laser and EDTA, citric acid were statistically similar ($p>0.05$) and showed intermediate values of dentine permeability when compared to the other treatments.

P81

Effect of the laser 635nm on the healing of atrimonial mucosal wounds.

Pozi, E. A. C. ; Alves, M. J. P. C. ; Pinheiro, A .L .B. ; Gerbi, M. E. M. ; Azevedo, A. C. L. ; Ponzi, E.A.C .

Mestre em Cirurgia e Traumatologia Buco Maxilo Facial - Universidade Federal de Pernambuco.

The mechanisms of the LLLT non thermal effect are attributable to the increase of serotonin and mitochondrial adenosine-tri-phosphate levels (subcellular biochemical effects), and also the changes in the cytoplasmic membrane and in the membrane mediators what would enhance cellular metabolism locally. In this experimental work, LLLT has been tested by using HeNe laser. It was used a 635nm-4mW-3J/cm². The reasearch consisted of three applications with 635nm Laser that had been administered in the following way: the first immediately after the burn, the second 48 hours after and the third 5 days later. The time spent for each application was 12,30 minutes, which means 3J/cm² for each one of the application resulting in an average dose of 9J/cm². There had been 40 rats divided in three groups like this: control (15 rats), placebo (10 rats) and Laser therapy (15 rats). Each group was divided in three subgroups, each one with five animals and sacrifices taking place in 2, 5 and 9 days. Ours conclusion was that the 635nm Laser improved the wound healing in rat mucosa burn, but was found a big edema immediately after the first application.

P82

Effect of the radiations of the lasers 670 diode of and 635nm on Candida Albicans: Study in Vitro

Ponzi, E. A. C. ; Silva, M.P.C.; Gerbi, M.E.M.; Alves, M.J.P.C.; Sá, V.C.T.; Pinheiro, A.L.B..

Mestre em Cirurgia e Traumatologia Buco Maxilo Facial

Universidade Federal de Pernambuco.

This study aimed to assess the effect of the use of lasers (635; 670nm) on *Candida albicans* In Vitro. Cultures of microorganism were irradiated with and without artificial illumination and non-irradiated cultures acted as controls. A single irradiation with the dose of 1.5J/cm² was used and measurements of DO and NC assessed the effects of the irradiation. The measurements were carried out with 24 (T1), 48 (T2) and 72 (T3) after irradiation. The results showed a significant difference between groups with relation to the DO on the presence of illumination. There are significant differences between the three groups at T1 and T3, related to the NC. In all situations significant differences were observed highest values occurred when illumination was not used. Cultures irradiated with the laser 635nm grow faster than those irradiated with the laser 670nm. Measurements of DO/NC were sensitive to detect changes in *Candida albicans* cultures irradiated or not. It is concluded that a single irradiation of *Candida albicans* cultures with laser of 670 and 635nm results in proliferation of the microorganism in Vitro.

P83

Low-level laser therapy as an important tool to treat disorders of the maxillofacial region.

Pozza, D.H. ; Oliveira, M.G.; Carneiro, R.; Souza, A.P.C.; Carvalho, C.M.; Pinheiro, A.L.B..

Doutorando em Laser pela UFBA - Bahia.

This study reports the result of the use of Lasertherapy on the treatment of several disorders of the oral and maxillofacial region. Twenty five females and six males patients ages between 22 and 78 years old (average 50 years old), suffering from disorders of the maxillofacial region, were treated with 660nm, 665nm, 780nm and associations (660nm+ 780nm and 665nm+ 780nm) diode Laser at the Laser Center of Dentistry School of Universidade Federal da Bahia, Salvador, Bahia, Brazil. The disorders included temporomandibular joint pain (15 patients), trigeminal neuralgia (10 patients), paresthesia (2 Patients) tooth hypersensitivity (2 patients) and mucositis (2 patients). Most treatment consisted of a series of 12 applications (twice a week). Patients were treated with an average dose of 15.8J/cm². Twenty six (83.8%) out of thirty-one patients were asymptomatic at the end of the treatment and five improved (16.2%). These results confirm that Lasertherapy is an effective tool and is beneficial for

the treatment of many disorders of the maxillofacial region.

P84

Use of lasertherapy of the bucco-maxillo-facial pathologies complex.

Ribeiro Neto, N.; Marzola, C.; Pinheiro, A. L.B.; Santos, R.C.; Pinheiro, A.L .B.. Doutorando em Laser Em Odontologia na UFBA/UFPPB.

The present study involved 38 patients from the surgery and Traumatology Center of the "Hospital de Base", Bauru, SP, Hospitla " Celina Gonçalves", Marabá, PA and from the course on the Surgery and Traumatology of FUN-BEO/FOB-USP. All patients some alteration of the bucco-maxillo-facial complex and were treated with non-surgical Laser therapy (GaAlAsO).Results showed that the average treatment sessions were 10(max=30 min=3).Approximately 84% of the patients presented remarkable improvement in the sintomatology (N=32), 10% remained stable(N=4) and in only 5% (N=2) the sintomatology was worse.The areas with higher percentage of the applications were the masseter muscle and pre-auricular (10 applications each, followed by the infra orbital (8 applications, and lingual nerve and mentoniane with seven applications each. Another 23 different regions of application were include in the therapy. Results indicate the Lasertherapy is an important tool for the re-establishment of the normal bucco-maxillo-facial complex.

P85

Effect of the photo therapy the healing process of wounds in nourished animal.

Ribeiro Neto, N.; Pinheiro, A.L.B. ; Ramalho, L.M.P. ; Vieira, A.L.B. ; Almeida, D.; Pinheiro, A.L.B..

Doutorando em Laser Em Odontologia na UFBA/UFPPB .

The purpose of this study was to analyse, uuder light microscopy, the effect of the diet: the Laser therapy(.780 nm) and the Photo therapy (.400-2000 nm) in the repair (healing) process of surgical wounds.Twenty five Wistar rats were subdivided into five groups and a standardized excisional wound was created on their backs(in their dorsum): Two control groups, and the experimental group were irradiated or illuminated during seven days (780 nm,...2nm, 40mW or.. 400 - 2000 nm, .. 5,5 cm, 40 mW and doses

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of 20J/cm² and 40 J/cm²). The animals were sacrificed on the eighth day after the surgery and specimens were removed, processed, dyed and analyzed in accordance with the following parameters: epithelial pavement; inflammation; fibroblastic proliferation; organization and maturation of the collagenous fibers. In all the groups that were exposed to irradiation, the quantity of collagenous fibers increased and a better organization took place, moreover a better standard inflammatory process in relation to the control groups. The conclusion: The nutritional factor intervened in the repair process and the photo therapy showed positive bio-modulation in the healing process of the wounds.

P86

Role of enamel components in dental susceptibility to caries development: A FT - Raman Analysis.

Rodrigues, L. K. A.; Soares L. E. S.; Martin A. A.; Brugnera Júnior, A.; Zanin F; Nobre dos Santos, M. Unicamp/Piracicaba/SP.

It is well known that enamel components are related to enamel caries susceptibility. Thus, this study aimed to determine the enamel components that make it more susceptible to in vitro demineralization. Fourier transform Raman Spectroscopy (FTRS) was used to study the relative amounts of organic material and mineral of enamel before and after being submitted to an 8-day pH cycling model using fluoridated toothpaste. FTRS was performed in 20 enamel slabs which were subsequently demineralized, after this procedure, the slabs were again analyzed by FTRS. The cross-section microhardness was performed for mineral loss (ΔZ) quantification. Slabs that presented the biggest differences in the caries development pattern ($n=7$), considering ΔZ mean, were selected in order to constitute 2 groups with statistically different ΔZ values, more demineralized group (MDG) and less demineralized group (LDG) which had $\Delta Z=2,450.64 \pm a$ and $892.3 \pm 229.2b$, respectively. The differences between both MDG and LDG with regard to enamel components (phosphate, carbonate, calcium fluoride and organic matrix) determined by FTRS, before and after pH cycling, were assessed by t test (at a level of significance of 0.05). The results showed that all groups presented less carbonate and organic compounds after demineralization. With regard to phosphate content, LDG showed no difference between this component before and after pH cycling. Before pH cycling, MDG carbonate content

was statistically greater than that found in LDG. This presence of correspondent band of calcium fluoride was not observed after pH-cycling. In conclusion, just carbonate quantity influenced enamel susceptibility to in vitro demineralization.

P87

Effects of the CO₂ laser combined with fluoridated tooth paste on human dental enamel

Rodrigues, L. K. A.; Vidigal A.E.; Soares L. E. S.; Martin A. A.; Brugnera Júnior, A.; Zanin F; Nobre dos Santos, M. Unicamp/Piracicaba/SP.

This in vitro pilot study investigated the CO₂ laser effects on caries inhibition in sound human dental enamel. Thirty six human enamel specimens were used and were randomly assigned to six groups: I) Control; II) 1W; III) 2W; IV) 3W; V) 4W; VI) 5W. The control group was not irradiated and the other ones were irradiated using low crescent potencies and a tooth whitening tip. Fourier transform Raman Spectroscopy (FTRS) was used to study the surface composition of specimens after irradiation. One specimen from each group was analyzed by Scanning Electron Microscopy and the remaining ones were submitted to an 8-day pH cycling model (demineralizing solution pH=4.6 and remineralizing solution pH=7.0) with use of fluoridated toothpaste twice a day. After pH-cycling, the cross-section microhardness was performed for mineral loss (ΔZ) quantification. The data were analyzed by ANOVA and Tukey's test (at a significant level of 0.05). No alterations were found either in SEM photomicroographies or RAMAN Spectrum of the specimens in all groups. The values of ($n=5$; média DP) for I-VI groups were: 1741.6 725.3a; 1782.7 639.0a; 1427.2 237.0a; 1780.6 552.4a; 1385.2 602.2a; 943.1 228.1a. The only group which presented percentage of caries inhibition was group VI (45.8%); however the differences among ΔZ of the irradiated groups were not statistically significant when compared to Control Group. The use of CO₂ laser with low fluencies did not prevent more caries development than the use of fluoridated toothpaste, even though group V had present good results in caries inhibition.

P88

Diode laser and ankyloglossia: A clinical study.

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Laboratory of Surfaces Interfaces in Odontology, University of Nice Sophia Antipolis (France)

In case of ankyloglossia, the tongue cannot protrude over the inci-

sors because the lingual frenum is too short. The distance between the tongue tip and frenum insertion is clinically acceptable when the distance is over 16mm, measured when the tongue is touching the palate with mouth opened. The complete ankyloglossia (4th class) is obtained when the distance is lower than 3mm. A short lingual frenum may produce malocclusions such as total open bite caused by interdental lingual interposition or malocclusion of class III with a push on the mandibular arch. Moreover, abnormalities of lingual frenum take a great importance in functional re-education of deglutition and phonation because they can considerably reduce the mobility and particularly the capability of rising of the tongue. The use of diode laser in lingual frenula surgery is indicated in three main clinical cases corresponding to light, medium and severe ankyloglossia. The parameters used in this clinical study ranged from: =810 and 980nm, 4-20W, Cw and HFS (10000Hz), fiber: 400µm, PD=31.8 to 15923.56W/cm², fluence=31.8 to 2627.38J/cm². The hemostasis, and its consequences in term of bleeding retention, makes comfort. Healing was satisfactory.

P89

Use of LLLT as coadjuvant in oral candidiasis treatment.

Silverio, M.B.; Coelho, C.M.P.; Alfredo, E.; Brugnera Júnior, A.; Sousa, Y.T.C. S..

Centro de Laser da Unaerp/Ribeirão Preto/SP

Atrophic chronic candidiasis is a frequent fungal infection in the oral cavity in patients that use total or partial prosthesis. The aim of the present study was to evaluate the use of LLLT a coadjuvant in the treatment of oral candidiasis. The patients with oral candidiasis were divided into 3 groups according to the treatment procedure: antifungal ointment, laser therapy or antifungal ointment and laser therapy. All patients wer instructed to clean their prosthesis with a hard tooth brush and soap and soak it overnight in sodium bicarbonate. The conventional treatment was performed with 3 topic applications of nistidine a week. Laser application was performed with a 685 nm diode laser, 35 W and 4 J/cm twice a week. The treatment was performed in each group until the lesion disappeared or up to 30 days. The results show that the isolated laser application was not adequate for the infection elimination. However, the association between the antifungal ointment and the LLLT presented the best results when compared to conventional treatment.

P90

Raman Study of human dentin irradiated with Er:YAG laser.

Soares, L.E.S.; Brugnera Júnior, A.; Zanin, F.; Arisawa, E.A.; Pacheco, M.T.T. ; Martin, A.A. .

Doutorando em Engenharia Biomédica (IP&D-UNIVAP).
Biomedical Laser Center - Univap

Raman Spectroscopy was used to examine the distribution of the mineral and organic components in the human dentin before and after the chemical and thermal etching process. Polished dentin disks (n = 6/group) with 4mm thickness from twelve third molars were irradiated with Er:YAG laser. Four pretreatment were performed. The disks were etched with 37% phosphoric acid (group I), Er:YAG laser 80mJ, 3Hz, 30s. (group II), Er:YAG laser 120mJ, 3Hz, 30s. (group III) and Er:YAG laser 180mJ, 3Hz, 30s. (group IV). The Raman spectra obtained from normal and treated dentin were analyzed. Attention was paid to the mineral PO₄ (962 cm⁻¹), CO₃ (1073 cm⁻¹) and to the organic component (1453cm⁻¹). Raman spectroscopy showed that the mineral and organic dentin content were more affected in autoclaved teeth than in the specimens treated by Thymol. Peak area reduction in the specimens treated by Thymol in group I and II showed to be the most conservative procedures regarding to changes in organic and inorganic dentin components. Pulse energies of 120 and 180mJ showed to produce more reduction in the organic and inorganic content associated with more reduction in the peak areas at 960 and 1453cm⁻¹.

P91

Effect of post-irradiation wate spray on intrapulpal temperature after Er:YAG laser irradiation.

Ahn, S.-W. ; Park, N.-S ; Kim, M.-E. ; Kim, K.-S..

Background : Temperature rise in the pulp was found to last in a few seconds after Er:YAG laser irradiation. Purpose : This study was performed to investigate the effect of post-irradiation water spray on intrapulpal temperature rise after Er:YAG laser irradiation. Material and Methods : Each of tooth specimens was embedded into a resin block and temperature-measuring probes were placed on the irradiated and opposite pulpal walls. Er:YAG laser was set at 300mJ, 20Hz and water flow rate of 1.6ml/min. Laser beam was applied over enamel surface during 3 seconds. Each lasing was followed by; no

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addition, 1-second and 2-second addition of post-irradiation water spray and temperature was monitored. Results : There existed significant temperature rise on the irradiated pulpal wall without addition of water spray after irradiation. However, addition of water spray for a second or two seconds after irradiation significantly decreased the temperature compared to no application of post-irradiation water spray and there was no significant difference between 1- and 2-second groups. Discussion and Conclusion : It is possibly suggested that addition of water spray for a second and more after irradiation reduces post-irradiation temperature rise which may lead to thermal damage on the dental pulp.

P92

A case report of photodynamic therapy on bacterial reduction before immediate implant.

Suzuki, L.C.; Yamada Júnior, A.M.; Hayek, R.R.A.; Ribeiro, M.S..

Recent studies have demonstrated that a number of oral bacteria can be killed by photodynamic therapy with low concentrations of dyes. Photodynamic therapy is the combination of light with appropriate wavelength and a photosensitizer. The antimicrobial activity is mainly mediated by singlet oxygen and/or free radicals generated by the photoactivated sensitizer. A flap surgery aiming an immediate implant was made in a residual root with periodontal lesion on upper first premolar. After the extraction, a microbiological sample with sterile paper points was harvested. Then, the photosensitizer was applied in the infected alveolus and irradiated with low-intensity laser, $\lambda = 660$ nm, P= 30 mW and E= 9 J . After the photodynamic therapy, a new microbiological sample was harvested. Subsequently, it was prepared the implant bed with conical burs and then the implant was placed. Patient was medicated with antibiotic after surgery. The microbiological analysis showed a significant reduction of *Prevotella* sp., *Fusobacterium* sp. and *Streptococcus* beta-hemoliticus. This finding suggests that photodynamic therapy is an alternative method to disinfect alveolus before implant placement. Therefore, this study highlights the need for future work in the area of photodynamic therapy to reduce bacteria without harming host tissue.

P93

Micro tensile bond strength of antibacterial self-etching adhesive system to Er:YAG Laser irradiated human dentin.

Suzuki, T.; Eguto, T.; Katsuomi, I.; Nara, Y..

The purpose of this study was to examine the μ -TBS of antibacterial self-etching adhesive system to Er:YAG laser irradiated human dentin. The standardized cavities were prepared finally with Er:YAG laser (L), DELight (HOYA ConBio) or steel bur (B) in the cervical region of 40 human premolars. The cavities were restored with a resin composite (Clearfil AP-X/Kuraray), and an antibacterial self-etching adhesives (P:Clearfil Protect Bond/Kuraray) or a self-etching adhesives (S:Clearfil SE Bond/Kuraray). A combination stress, thermal cycling (4 \times 60 \times 2,500cycles) and simultaneous repeated load (12 kgf \times 105), was applied to four types (LP, BP, LS, BS) of restored specimen (n=10). The μ -TBS of the specimens after the stress were measured. The data were analyzed by ANOVA and Tukey-Kramer test. The mean TBS(s.d.) in MPa were LP;6.96(4.61), BP;12.43(4.77), LS;9.02(4.92), BS;15.35(6.06). The μ -TBS of L was significantly lower than that of B. There was no significant difference in the μ -TBS between P and S. It was confirmed that the Er:YAG laser irradiation to the cavity wall decreased the dentin bond strength compared to the bur-preparation. The μ -TBS of Clearfil Protect Bond to Er:YAG laser irradiated dentin had similar value with Clearfil SE Bond.

P94

Effect of Er:YAG laser irradiation on the root surface treated with Edta. A SEM Study.

Theodoro, L.H. ; Santana, T.C.; Kabbach, W.; Marcântonio, R.A.C.; Sampaio, J.E.C.; Garcia, V.G.

Doutora em Periodontia- Araraquara-UNESP.

The aim of this study was to evaluate by SEM the effect of Er:YAG laser(2.94 μ m) irradiation on the closed of dentinal tubules on root surface. Were obtained two root samples of twenty human pre-molar and molars (n=40).The cementum was removed and the sample were treated with 24 % EDTA and divided into 4 groups. The samples were irradiated only in it half and another part were considered control group: G1-Er:YAG laser no focalized (60 mJ,2 Hz,30 s);G2- Er:YAG laser focalized (60 mJ,2 Hz, 30 s);G3 Er:YAG laser no focalized (80mJ,2Hz,30 s); G4- Er:YAG laser focalized(80 mJ,2 Hz,30 s.The sample were analyzed by SEM and the photomicrographs were analyzed by a score. The results showed that G1, G2 and G3 were not effective to close dentinal tubules and the G4 were effective in the tubules obliteration when compared to the control group (p=0.004). In conclu-

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sion, the Er:YAG laser focalized in parameters used in G4 were effective in the treatment of dentinal tubules opened, but caused micro-roughness on the root surface and the focalized mode provoked morphological changes on the root surface.

P95

Removal of broken files using pulsed Nd:YAG Laser irradiation - A preliminary study.

Takeda, A.; Anjo, T.; Ebihara, A.; Suda, H.; Takahashi, H.; Suda, H..

The purpose of this study was to evaluate a new method for the removal of intracanal broken instruments using laser welding. Twenty-four tips of K files, (diameter: 0.35 mm), were used in the first experiment. After a hollow stainless-steel tube was inserted into the tip, an optical fiber was introduced into the tube to touch the tip, and a Nd:YAG laser was irradiated (output energy: 300-600mJ; 10 pps; 1 sec). Then, removal force of tips were measured using a universal test machine. In the second experiment, 30 tips of K files (diameter: 0.25-0.45 mm) were used. After setting as in the first experiment, the laser was irradiated at 400 mJ. In the first experiment, laser welding was successful in all samples. The maximum loads for removing tips in the 300 mJ, 400 mJ, 500 mJ and 600 mJ groups were 2.10±1.29 kgf, 5.86±1.42 kgf, 5.29±1.18 kgf and 5.17±1.17 kgf, respectively. In the second experiment, laser welding was successful in all samples except three samples in the 0.25 mm group. Since the stainless-steel tube is able to reach the deep portion of the root canal, this method could be promising for the removal of intracanal broken instruments.

P96

Handling of patients suffering from neuro-motor deficit treated with lasertherapy

Varellis, M.L.Z.; Brugnera Júnior, A.; Zanin, F.; Pinheiro, A.L.B..

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Neuromotor deficiency patients have involuntary movement which make difficult its positioning on the dental chair during the dental treatment. These patient has no control upon their body movements and they need support and help from their dentist for safe and effective dental treatment. There are several

techniques to stabilize the patient on the dental chair, varying from stripes to specially designed devices. Immobilization of arms and legs is important because of sudden movements. The use of immobilization during the use of both surgical and non-surgical laser is extremely advised. This work, reports a case of patients suffering from neuromotor deficiency who undergone dental laser treatment.

P97

The importance of training for the correct use of the DIAGNOdent.

Dias, P. V.; Isidoro, K. R.; Ladalardo, T. C.; Campos, D. H. S.; Brugnera Júnior, A.; Zanin, V.; Zanin, S.; Zanin, F.

Centro de Atendimento do Grupo Voluntários do Sorriso da Escola Paulista de Medicina - UNIFESP, SP - Brasil

The laser is the light form that is being used in the biological science and technologies. In the dentistry, has been used in the treatment as well as in the lesion diagnosis.

The DIAGNOdent - German is a system that uses the laser fluorescence to detect the level of dental mineralization. The active agent is a red diode, with wavelength 632 up to 655 nm, power shorter than or equal to 1 mW.

A group of twelve dentists without experience in work with this equipment, together with two experienced dentists with large know-how in equipment handling, participated to conclude this research. All professionals were members of the grupo voluntários do sorriso da unifesp (smile voluntaries group of unifesp).

Firstly, classes were provided for general knowledge about the diagnostic laser (DIAGNOdent) and a protocol was presented, showing the real importance of the dental anatomy and physiology to diagnose in the cariology the demineralization process.

After that, all members were submitted to a measurement "in vitro" with pre molars and molars human teeth in the occlusal surface (pre determinate points) and the values were collected.

Right after, occurred a demonstration of the equipment use in practical classes and everybody was submitted to a new measurement. Comparing to the obtained results by the two experienced examiners (standard) with those submitted to the test, it was verified the value variation from the first to the second measurement.

The mistakes noticed in the first measurement were insufficient exposition time, contact mode, calibration and measurement of the place with the position in several directions.

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As soon after the practical training, a closeness was observed among the collect data, and values were closed to the standard. The objective of this job was to emphasize the necessity of practical experience to have smaller chance of mistake in the equipment handling.

P98

Analysis of the level of demineralization of the dental enamel using laser fluorescence technique after dental bleaching.

Dias, P.V; Ladalardo, C. C. G.; Rogério, V. Campos, D. H. S.; Brugnera Júnior, A; Zanin, F.

Instituto Brugnera&Zanin - São Paulo

Nowadays the dentistry uses clinical approach more biologic, in the diagnoses as well as in the treatment. The dental breaching with laser and LED became an usual procedure in the dentistry clinical, being necessary to conclude study that show the structural conservation front to these procedures.

The objective of this clinical study was to evaluate the mineralization grade of dental enamel before and after the dental breaching with two different sources of photonic emission, argon laser and LED, by fluorescence technical, with DIAGNOdent.

We evaluated with DIAGNOdent, Kavo-Germany, of 655 nm, 1mW, continuous in a lot of 345 teeth of 36 people originating from two groups of different technical breaching, calls of group A, dental breaching made with argonio laser (488nm, 200 mW, Laser Med - USA) and group L (led kondortech, 470 nm, 47 mW, diode laser associated of 790 nm and 40 mW).

The group A with total of 173 teeth, originating from 19 people and the group L 172 teeth from 19 people. The breaching method was identical in both groups varying only the source photonic issuing.

It was taken a measurement of the mineralization grade in two steps - before and after dental breaching.

The average of the mineralization grade before the breaching in the group A was 3.46 and the group L was 2.62. Right after the breaching the group A showed average values of 2.93 and group L of 2.13. Considering the obtained results we concluded that both the dental breaching technical, laser and LED don't promote detectable mineral loss by fluorescence technical.

P99

Clinics applications for therapeutic lasers stud-

ies linked to trigemeo nerve

Vilela, R.G ; Frigo, L..

Curso de mestrado pela Unicsul-SP.

The objective of the study was to make a bibliographical revision of the Clinical application of therapeutical laser in Trigemeo nerve. The trigemeo thus is called by possessing three largests branches distributed by extensive areas of the face. These form the sensitive nerve portion and receive denominations in agreement its main territories of distribution. The first branch, oftalmic, is named like that because is directed for the orbit; the second, superior jaw nerve, goes to superior jawbone and the third, inferior jaw one is complished by a motor branche and goes to the jaw. In Odontology we fall in with the engaged of one or more branches of this nerve in parestesias, varicela-zoster, surgery of lateralization of the inferior alveolar nerve, trigemeo neuralgia and implantodonty. In these cases, the therapeutical laser, can act as a coadjuvant of the sintomatology treatment, as analgesic, antiinflamatory and bioestimulant. It was verified how important this knowledge is when general clinic wants to offer one more treatment option providing confort for the patient.

P100

Main used types of lasers in the Odontologic clinic, low and high intensity laser and its applications.

Vilela, R.G; Senna, J..

Curso de mestrado pela Unicsul-SP.

The objective of the research was to make a revision of main lasers used in Odontology: Therapeutic Lasers (Helium-Neonium, Gallium Arsenate and Gallium Arsenate Aluminum) and of High Intensity (Excimer, Argon, YAG Family, Neodimium-YAP and CO2), showing its main characteristics, clinical applications and indications. The use of the therapeutical lasers as analgesic, antiinflamatory and bioestimulante showing which is the differences between the active substancies of the helium-neon laser and lasers of diode and its respective wave lengths, comparing them with surgical lasers, also showing the differences between them, as affinity or not for water, weaveeed pigmented, types of emission and clinical applications. The work

also talk about the argon laser and its characteristics in the photo-dynamics therapy.

P101

Effects of CO₂ laser irradiation on pulp fibroblast.

Yamaguchi, H. ; Kobayashi, K.; Nagano, T.; Shirakawa, S.; Gomi, K.; Arai, T.

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Department of Periodontics and Endodontics Tsurumi University School of Dental Medicine - Yokohama, Kanagawa, Japan.

Summary: Back ground: The CO₂ laser seems to be a valuable aid for direct pulp capping, however, the mechanisms are still unclear.

Purpose: The aim of this study was to evaluate pulsed CO₂ laser irradiation to pulp fibroblast of cell culture.

Material and methods: The pulp fibroblast samples were collected from human extracted teeth.

The specimens were cultured (10-day) with or without CO₂ laser irradiation.

After the cultivation, fibroblast cells were identified using hemacytometer.

Results: The number of fibroblast cells of laser irradiation specimens was significantly higher than that without laser irradiation (n=8 t-test p<0.01).

Discussion and Conclusion: It was suggested that pulsed CO₂ laser irradiation tends to accelerate cell proliferation.

P102

Laser and LED external teeth bleaching.

Zanin, F.; Brugnera Júnior, A.; Marchezan, M.; Pécora, J.D.. Biomedical Laser Center IPD-UNIVAP, Laboratório de Endodontia FORPUSP.

Teeth-bleaching is an initial phase in the reproduction of an aesthetic smile; thus, it is very important that the dentist knows how to diagnose the causes of color changes and indicate whitening before proposing dental treatment. Technological advances in teeth-whitening lead to the development of new techniques, improving comfort, security and decreasing time of execution: argon laser, diode Laser, LED whitening, xenon light whitening. The clearing agent used in all techniques, including home whitening, is hydrogen peroxide (H₂O₂) in different concentrations. In this study, the authors describe mechanisms of gel activation, the use of Laser and LED's for teeth-bleaching, the

importance of diagnosis and the comfort of the patient in in-office teeth-bleaching techniques.

P103

Antimicrobial effect of low level laser therapy in the presence of photosensitizer on human saliva.

Zanin, I.C.J.; Brugnera Júnior, A.; Höfling, J.F.; Zanin, F.; Gonçalves, R.B..

School of Dentistry, State University of Campinas, SP, Brazil, (ABJ and FAAZ, Biomedical Laser Center - UNIVAP, Camilo Castelo Branco University and APCD, São Paulo, Brazil.

The purpose of this in vitro study was to determine whether low power laser light in the presence of a photosensitizer can kill Streptococci present in human saliva. Samples of stimulated saliva were collected from ten healthy subjects, the samples were mixed and was exposed to a gallium-aluminium-arsenide laser light (660 nm) in the presence of Toluidine Blue O. The number of viable total Streptococci and Streptococcus mutans were counted on plates with MSA and MSB respectively, after incubated at 37°C, 10% CO₂ for 48 hours. Their exposure to the laser light in the absence of the dye or the dye in the absence of the laser light had no significant effect on the viability of the microorganisms. A decrease in the number of viable microorganisms was only verified when they were exposed to both the laser light and the dye at the same time. A total inhibition growth of the Streptococcus mutans and a substantial killing rate of total Streptococci were achieved with a dye concentration of 0.1 mg/ml and a energy density of 28.8 J/cm². These results imply that these bacteria can be killed by low-power laser light in the presence of this photosensitizer.

P104

Avaliation of the temperature and vickers hardness of the composite resin when cured with argon laser 488nm and halogen light.

Zanin, S.; Zanin, F.; Brugnera Júnior, A.; Silveira Júnior, L.. Curso de Mestrado em Bioengenharia Laser - UNIVAP - São José dos Campos - SP.

The clinical performace of composite resins applied in dental restorations is influenced by the quality of the curing light (MENINGA et al, 1997). Composite resins are photoactivated in

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the presence of light in the blue range (470 nm a 500 nm) (BLANKENAU et al, 1995). The halogen light has normally been applied, however its effectiveness is reduced by the utilization of optical filters. The light from Argon Laser (488 nm) is studied as a substitute. The purpose of their hardness and temperature increase when photopolymerized by the light of a Argon laser device (488 nm) (LASER) and by the light of a commercial photopolymerizer (PHOTO). Measures of hardness (Vickers) and dental pulp temperature had been made. According to the applied methodology and the obtained results, it can be concluded that both methods for composite resins polymerization promote small temperature increases of statistically equivalent values. In addition, the polymerization activation by argon laser produces composite resins which are harder than those polymerized by halogen light, what indicates the superior effectiveness of that method over the latter.

P105**Monte-Carlo Modelling of light propagation in hard dental tissues.**

Zzell, D.M. ; Miyakawa, W.; Riva, R.; Watanuki, J.T.

In the Monte-Carlo model, we simulated the propagation of visible light and the temperature distribution in human tooth, which reflects the energy deposited in the tooth by the laser. As a turbid medium, differences in absorption and scattering coefficients of the enamel and dentine must be taken into account. These data are not completely established in the literature in the visible range. The results are compared with experimental data of Cu-HyBrID laser light propagation in human molar teeth, in order to evaluate the scattering coefficient. The Cu-HyBrID laser emits green (510 nm) and yellow (578 nm) radiation with high output peak power (20 kW) at high repetition rates (13.7 kHz) and there is almost no report of its use in Dentistry. This work aims to correlate the Cu-HyBrID energy deposition with the tooth thermal response. The tooth is predominantly a scattering medium (absorption much lower than scattering) and small variations in the absorption coefficient do not reveal significant alterations in the light distribution curve. According to the simulation, most of the laser energy is accumulated on enamel-dentine junction and the tooth thermal response is strongly affected by the value of the absorption coefficient, which is not yet precisely known.

P106**Fluoride incorporation and acid resistance of****dental enamel irradiated with Er:YAG: Atomic absorption spectrometry and Spectrophotometry.**

Zzell, D.M.; Bevilacqua, F.M.; Magnani, R.; Ana, P.A.; Eduardo, C.P.

Er:YAG effects on dental enamel surface regarding the resistance to demineralization and the fluoride incorporation were evaluated. 80 samples were divided into 8 groups: G1) control - APF application; G2) conditioning with 37% phosphoric acid and APF application; G3) irradiation with 250 mJ/pulse, 7 Hz, 31,84 J/cm² (contact) and APF application; G4) irradiation with 200 mJ/pulse, 7 Hz, 25,47 J/cm² (contact) and APF application; G5) irradiation with 150 mJ/pulse, 7 Hz, 19,10 J/cm² (contact) and APF application; G6) irradiation with 250 mJ/pulse, 7 Hz, 2,08 J/cm² (non-contact) and APF application; G7) irradiation with 200 mJ/pulse, 7 Hz, 1,8 J/cm² (non-contact) and APF application; G8) irradiation with 100 mJ/pulse, 7 Hz, 0,9 J/cm² (non-contact) and APF application. All samples were immersed in 2,0 M acetic-acetate acid solution, pH 4,5 for 8 hours. The fluoride, calcium and phosphorous ions were analyzed, by atomic absorption spectrometry and spectrophotometry. Groups laser irradiated before topical APF application presented better results than the control. There was higher fluoride incorporation on G7 and G8. Calcium and phosphorous analysis revealed a decrease on the enamel demineralization on G2 and G3 groups. The Er:YAG laser on irradiation conditions of this work is a promissory alternative for the Preventive Dentistry.

P107**Quantitative evaluation of intact peripheral nerve structures after CO₂ laser, electrocautery and scalpel.**

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Doutor em Cirurgia e Traumatologia Bucocomaxilofacial.

This study aimed to evaluate quantitatively integrity of nerve structures near CO₂ laser incisions. A comparative study was carried out using 25 animals (*Rattus Norvegicus*) divided into five groups of 5 animals each. Standard incisions were carried on the dorsum of the tongue of each animal using the electrocautery (group 2), scalpel (group 3), CW CO₂ laser (group 4) and SPS

CO₂ (group 5); group 1 served as control. The animals were killed immediately after the experiment, and specimens were taken and routinely processed to wax. Three-micrometer sections were cut and stained using S-100 protein antibody. The stained sections were analyzed under light microscopy and the number of intact nerves was counted in five standard areas around the incision. The results showed that there were no statistically significant differences in the numbers of intact peripheral nerve structures in both laser groups and other groups. No statistically significant difference was found between non-operated and scalpel groups. The number of intact peripheral structures in cattery wounds was significantly smaller than in non-operated and scalpel wounds. Immediate destruction of peripheral nerve structures isn't the cause of post-operative analgesia following CO₂ laser surgery.

P108

The use of the CR-P levels as marker of the antiinflammatory effect of 830nm laser light.

Ribeiro, M.A.; Freitas, A.C. ; Pinheiro, A.L.B. ; Ramalho, L.M.P.; Vieira, A.L..

The antiinflammatory effect of non-surgical Lasers has been proposed, however it was not scientifically proven. Amongst the methods to assess levels of inflammation is the measurement of CR-P, which is increased on the course of inflammation. The aim of this study was to assess the effect of 830nm Laser irradiation after the removal of impacted third molars using the CR-P as marker of inflammation. The patients were irradiated with 830nm Laser with focal distance of 0,5cm during two minutes (4,8 Joules/session). Twenty - four patients participated on this study. Lasertherapy was used 24 and 48hs after surgery. Control Group was treated with a sham Laser. Blood samples were taken prior, 48 and 72hs after surgery. CR-P values 48 hours after surgery were more symmetric and better distributed on the irradiated group than on the control, however no significant difference was found. After 72 hours both groups had similar results as expected, because of the normal tendency of decreasing CR-P levels.

P109

Resistance to deflection of titanium and Ni-Cr and Co-Cr alloys welded by Nd:YAG laser or TIG.

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Welding of metals and alloys is important to Dentistry because of its usage on the making of dental prosthesis. There are several methods of soldering metals and alloys which are currently in use. The aim of the present investigation was to assess the efficacy of welding of Titanium, Co-Cr and Ni-Cr alloys using the tensile strength as parameter. The targets were divided into four groups: Group I: controls (n=15); Group II: Nd:YAG laser welding (n=15); Group III, TIG welding (n=15); and Group IV: Nd:YAG Laser + filling material. The targets had their tensile strength measured and the results were analyzed using the Instat® software. The results of the tensile strength showed that soldering with TIG shows better results than the observed when the laser is used for the metal and the alloys used on the present investigation.

P110

In Vitro study of the Microleakage in cavity preparations with Er: YAG Laser in composite resin.

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Mestrando em Clínicas Odontológicas pela Faculdade de Odontologia da Universidade Federal da Bahia - Salvador BA.

Several conditions may interfere with the quality of restorations made of composite resins. Correct analysis of the actual situation of the restoration is of extreme importance in order to decide the correct handling of the problem. It means to take the decision of preserve it by repairing or remove it. The Er:YAG laser used with low energy densities is able of conditioning both enamel and dentine. Because of this abilities on this work aimed to observe the effect of the Er:YAG laser on the repair of composite resin restorations. Forty human molar teeth surgically removed previously restored with composite resin were divided into eight groups containing five teeth each. Groups 1 and 2 acted as non-irradiated controls. On these groups, a defect was created on the surface of the restoration with a diamond burr. On G1, 37% phosphoric acid was applied to the defect prior the use of the adhesive system. On G2 the acid was not used. On groups G3-G8, the Er:YAG laser was used to produce the

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defect as follows: G3 (3hZ,60mJ,6J,103 pulses). G4 (4hZ, 60mJ, 6J, 103 pulses), G5 (3hZ, 100mJ, 6J, 63 pulses). G6 (4hZ, 100mJ, 6J, 63 pulses). G7 (3hZ, 120mJ, 6J, 54 pulses), and G8 (4hZ, 120mJ, 6J, 55 pulses). All defects were restored using Z-250 composite resin and adhesive system. The specimens were routinely processed and microleakage assessed. The results of the analysis evidenced that less microleakage was seen when 4hz, 60mJ, 6J, 103 pulses and 4hZ120mJ, 6J,55 pulses treatments were done.

P111

Effects of the lasertherapy on CO2 laser wounds.

Soares, E.S.; Pinheiro, A.L.B.; Gonçalves, J.N.; Carvalho, T.O.; Nóia, C. M.; Gerbi, M.E.M..

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The use of the CO2 laser is mainly indicated for soft tissue surgery. Its main advantages are: accurate cut, hemostasis, dry surgical field, less edema, minimal wound contraction and less scar formation. However, thermal damage following its use is a great disadvantage resulting in large tissue damage and increased healing time. Lasertherapy effects on living tissues are well described in the literature. Only few works assessed the effects of lasertherapy on CO2 laser wounds. The aim of this study was to evaluate the effects of the use of 665nm, with 30mW and 830nm with 40mW laser light, (20J/cm²) on 1cmX1mm cutaneous CO2 laser (Sharplan 20C, 5W, RSP) and scalpel wounds, which acted as controls. Laser treatment consisted of two applications carried out at 48h interval. The dose was divided into four points around the wounded site. The specimens were taken three days after surgery, were routinely processed to wax and stained with H&E and Picrosirius stain. The results evidenced that as early as three days, Sirius red staining evidence increased collagen deposition on the experimental groups on both laser and scalpel wounds. The amount of collagen fibers was very high on subjects treated with Lasertherapy.

P112

Low Energ AsGaAl Laser (830nm) for the prevention of chemo-induced mucositis in patients with oral cancer.

Catão, M.H.C.V.; Costa, L.J.; Pinheiro, A.L.B..

Programa Integrado de Pós-Graduação em Odontologia UFPB/UFBA - Centro de Laser, FOUFBA.

Buccal toxicity of chemotherapy in patients with oral cancer can cause patients to become discouraged altering their quality of life. The purpose of study was to investigate the effects of low intensity laser AsGaAl(?=830nm), 2 J/cm² applied for each point, rank received chemotherapy in the prevention to minimize the severity of oral mucositis in patients with oral cavity cancer. The study was clinical test consisting of 12 patients, 10 men and 2 women, the age 41 to 75 years old . Laser illumination AsGaAl(?=830nm); 40mW;1,06s per point; 0,3mm spot size. The malignant tumor had to be located outside the areas selected for randomized preventive LLLT application. The criteria used for evaluation Mucositis severity was scored by an oral mucositis scale based on clinical features and by an oral toxicity scale World Health Organization (WHO). Based on the functional scale, 6 patients presented mucositis grade I (50,0%), 4 shower grade II (33,3%), 2 grade III(16,7) and none patients desenvolved mucositis grau IV.The efficacy of low-laser was well tolerated and showed beneficial effects on the management of oral mucositis on the quality of life of patients receiving oral cancer chemotherapy.

P113

Low Energ AsGaAl Laser (830nm) for the prevention of chemo or radio-induced oral mucositis in cancer patients

Catão, M.H.C.V.; Costa, L.J., Pinheiro, A.L.B..

Programa Integrado de Pós-Graduação em Odontologia UFPB/UFBA - Centro de Laser, FOUFBA.

Oral mucositis is one of the complications in the treatment oncology radiotherapy and chemotherapy associated, which can substantially change the patient's quality of life. The trial was open to patients with carcinoma oral cavity being treated by external radiotherapy. There were 23 men and 7 women, age 41-88 years old. Were assigned to either laser treatment (L+) or sham-treatment (L-) by blocked randomization. The protocol called for inclusion 30 patients received GaAlAs(?=830nm), 2 J/cm² for each point, before in the radiotherapy daily, each week during seven weeks. The average energy density delivered to the treatment areas was 2 J/cm² applied for each point, rank received radiotherapy and chemotherapy. Laser illumination consisted of a wavelength: ?= 830nm; 40mW, laser application until cessation of symptoms mucositis. The criteria used for evaluation were the standard WHO staging for mucositis. All L+ developed mucositis at week 2 (2 patients grade III mucositis, 7 with

grade II, 6 with grade I). All L- patients mucositis developed at week 2 (3 with grade III, 7 with grade II, 5 with grade I). In conclusion, low level AsGaAl laser seems to be a safe efficient method for the prevention of radiation -induced stomatitis and chemo-induced mucositis, with a combined modality treatment.

P114

Clinical and histologic evaluation of human intrabony defects treated with an Er:YAG laser.

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Objective: The aim of the present series of case reports was to clinically and histologically evaluate healing of human intrabony defects following access flap surgery with root surface and defect debridement using an Er:YAG laser.

Materials and methods: Six patients, each of whom displayed one advanced intrabony defect around teeth or roots scheduled for extraction, were included in the study. The defects were treated with access flap surgery followed by root surface and defect debridement with an Er:YAG Laser (KEY2® KaVo, Biberach, Germany) (160 mJ, 10 pulses/s). The following clinical parameters were recorded at baseline and at 6 months: probing depth (PD), gingival recession (GR) and clinical attachment level (CAL). Healing was uneventful in all cases. Six months after surgery, the teeth or roots were extracted together with some of their surrounding soft and hard tissues and processed for histologic evaluation.

Results: Clinical examination revealed PD reduction and a CAL gain in all six cases. The histological evaluation revealed that healing was predominantly characterized by formation of a long junctional epithelium along the instrumented root surface. Formation of a new connective tissue attachment (i.e. new cementum with inserting collagen fibers) was observed in two out of the six specimens. In one out of these two specimens the new connective tissue attachment was also accompanied by bone

regeneration. There was no evidence of laser induced thermal side effects in any of the evaluated specimens.

Conclusions: Within its limits, the present study failed to show predictable periodontal regeneration in advanced human intrabony defects following access flap surgery with root surface and defect debridement using an Er:YAG laser.

P115

Laser frenectomy (Nd:YAP) in Pediatric Dentistry

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The frenectomy, preconized treatment to the excision of lingual or labial frenun, presents several trans or post complications, when it made the conventional surgical methods. The utilization of surgical laser has being used in the several dentistry specialities. The purpose of this article was to present a case of lingual and labial frenectomies utilizing the Nd:YAP laser in a patient with 5 years-old, getting the best trans and post surgical conditions to the pediatric patient. The laser Nd:YAP laser was used with 250 mJ energy dose and 30Hz of frequency, promoting ablation.

P116

Influence of two single-bottle adhesive systems and two cure techniques on the marginal microleakage of Class V restoration following Er:YAG irradiation.

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The aim of this study In Vitro study was to evaluate the influence of two single-bottle adhesive systems and two curing techniques on the marginal microleakage of Class V restorations following drill and Er:YAG preparation. Eighty extracted human upper third molars were selected and divided into eight groups. Class V cavities were prepared on the vestibular surfaces of all specimens. On groups V, VI, VII and VIII, dentin and enamel surfaces were irradiated with Er:YAG laser (? 2940nm, 200?s, 200mJ/pulse, 60J, 250mW, 3Hz, 300i, 90s) following cavitation. The specimens of groups I and V were restored with Prime & Bond/Esthet X and

Poster Presentation

cured by visible light (?490nm). The same adhesive system and composite resin was used on groups II and VI, and cured with Argon laser (?488nm; 250mW, Ø=1cm, focal distance 20mm). The specimens on groups III and VII were restored with Single Bond/Z250 and cured by visible light (? 490nm). The same adhesive system and composite resin was used on IV and VIII groups however photoinitiated by Argon laser. The specimens were stained with Silver nitrate for assessment of microleakage on cervical and occlusal surfaces. The results were analysed by Mann Whitney test which shown significance differences ($p<0,05$) on irradiated dentin. Smaller level of microleakage was seen on Single Bond/Z250 restored specimens. It is concluded that SingleBond/Z250 cured by Argon laser resulted in smaller microleakage in Class V restorations after Er:YAG irradiation.

P117

Scanning eletron microscopic evaluation of dentin and enamel interface of Class V restorations after Er:YAG irradiation

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The aim of this In Vitro study was to evaluate, by SEM, the presence or absence of gaps on the resin/dentin and resin/enamel interfaces of Class V restorations prepared with drill or Er:YAG laser using two single-bottle adhesive systems and two curing techniques. Thirty two extracted human upper third molars teeth were used and divided into eight groups. Class V cavities were prepared on the vestibular surfaces of all specimes. However on groups V, VI, VII e VIII, the dentin and enamel surfaces were irradiated with Er:YAG laser (?2940nm, 200ms, 200mJ, 60J, 250mW, 3Hz, 300 i, 90s). The specimens of groups I and V were restored with Prime & Bond/Esthet X and cured by visible light (? 490nm); groups II and VI were restored with Prime & Bond/Esthet X and cured with Argon laser (? 488nm, 250mW, Ø=1cm, focal distance 20mm); groups III and VII were restored with Single Bond/Z250 and cured by current visible light; groups IV and VIII were restored with Single Bond/Z250 and e cured with Argon laser. The specimens were sectioned and routinely processed for SEM analysis and images. SingleBond/Z250 restored specimens cured by current visible light or Argon laser

showed similar results and good adaptation of the interfaces and absence of gaps on Er:YAG laser irradiated specimens. It is concluded that the use of the SingleBond/Z250 resulted in minimal gap formation on resin/dentin and resin/enamel interfaces irradiated by Er:YAG laser independent of the photoactivation system.

P118

Avaliation of enamel deciduos teeth after irradiation with Er-YAG laser irradiation through scanning electron microscopy.

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The purpose of this study was to analyze the enamel's structural alterations in deciduous canine human teeth, after irradiation with laser Er:YAG pulsed (2,94 um), in the short and very short pulse ways, in the class V

arrangement's, on vestibular and palatal surface.

To realize this study, twenty teeth coming from São Paulo's University Teeth Bank were used. The teeth were in water during 14 days before the irradiation with laser. After this period, these teeth were divided in two groups with ten each one.

The first group received irradiation with laser Er:YAG in the short pulse way on vestibular and palatal surface.

The second group received irradiation with laser Er:YAG in the very short pulse way on vestibular and palatal surface.

All the preparations were accomplished with the same application protocol, which was obtained through previous pilot study and doctrine.

The energy of pulse was 300mJ, the pulse repetition tax was 6 Hz and the application time was 12 seconds to each preparation.

After the experiment accomplishment, the teeth were submitted to scanning electron microscopic, to analyze the alterations happened in enamel.

P119

LLLT contribution in the treatment of erosive lichen planus

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Lichen planus is a muco-cutaneous disease that presents strong resistance to treatment because it is associated with emotional changes. The lesion is frequently presented in a typical or reticular form; the erosive form is atypical in which white areas are associated to extensive and painful ulcerations. We present a report of a case of lichen planus in which laser therapy was associated with conventional therapy. A 685 nm laser was applied pontually with a 4 J/cm² dose in the center of the lesion and surrounding areas with 35 W every 48 h. After the first sessions the patient reported pain remission, and after 12 sessions complete healing of the ulcerations was observed. Laser therapy contributed to the final treatment result.

P120

Analysis of Intrapulpar Temperature After Irradiation With Er:Yag in Deciduous Teeth. (in vitro).

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The purpose of this study was to analyze the intrapulpar temperature in human teeth in vitro, during an irradiation with Er:YAG laser

pulsed. The increase of the temperature, can many times cause dental injury damaging the pulpar vital. The effect of the temperature in the pulp was studied in deciduous healthy canines in vitro, during the process of cavity Class V, in vestibular and palatine surfaces with Er:YAG laer pulsed in short and very short pulse. The energy used was 300 mJ per pulse, frequency 6Hz, during 12 seconds. The intrapulpar temperature was mensured by a multimeter and a thermocouple during all the irradiation. It was observed that during the period of irradiation the increase of intrapulpar temperature, was not higher than 3,5°C, showing that the parameters used were safe fou use on cavities with Er:YAG laser, without damaging the vital pup.