mode. The beam diameter was 0.3 mm, which allowed the dissection of oral tissues with high precision or a soft peeling. The complete and good quality of Healing took place with minimal post-operative, discomfort and pain complaints. The use of CO_2 laser in prosthetic surgery gave better results than those of conventional treatment.

#141

CLINICAL TREATMENT OF TEETH HYPERSENSITIVITY

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Background: Previous study showed the possibility to seal the dentinal tubules by means of Nd-YAG laser. The aim of our study was to verify the efficiency of laboratory study on vital teeth.
Study: Laser irradiation conditions used were: Nd - YAG (Fotona Laser system; Fotona- Slovenia); 0,5–0,75 Watts; VSP pulse (120 μsec,); Beam diameter: 200 μm; 10 Hz; scanning speed: 2 mm/sec. (Pd 0,5 W = 1591,55 W/cm^2; Pd 0,75 W = 2387,325 W/cm^2). Before treatment, the surfaces of dental necks are covered by means of graphite substance. The laser beam is used without contact and with an angle of 45° with the surface. The lasering is used until complete removal of graphite. The evaluation of hypersensitivity reduction was made as following: The intensity of pain was evaluated before treatment and after by means of application of air flow on the surface of each tooth with 1 cm distance from the surface and during 3 seconds. The degree of hypersensitivity was evaluated using a graduated scale ranged from 0 to 10 before treatment and immediately after. The follow up recall of each patient was done one week later, 6 months and 1 year after treatment.
Results: The Mean of hypersensitivity before treatment was $7{,}787 \pm 0.8876$ and 2.912 ± 1.506 immediately after treatment. The means and SD of hypersensitivity were: $1{,}77 \pm 1.467$ at one week, $0{,}9180 \pm 0.34$ at 6 months and $0{,}78 \pm 0.21$ at 1 year after treatment.
Conclusion: Laser irradiation conditions used in our study are therapeutically relevant and efficient against teeth hypersensitivity.

#142

OPTICAL COHERENCE TOMOGRAPHY AND SCANNING ELECTRON MICROSCOPY ANALYSIS OF MICROABRASSION EFFECTS IN DECIDUOUS TEETH ENAMEL

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Background: The objective of this work was to study the effects of microabrassion in deciduous teeth enamel. The microabrassion was done in a vestibular surface of health deciduous teeth (n = 68) with 3 different materials: (A) phosphoric acid with and extra-fine pumice; (B) Opalustre® and (C) Whitness RM®.
Study: Each application was accomplished with rubber cup and contra-angle handpiece by 10 s, under controlled pressure and rotation. The teeth were submitted to Optical Coherence Tomography and Scanning Electron Microscopy analysis at 500 and 1000 μm from the center of the rubber cup after 0, 3, 5, 7 and 10 applications.
Results: It was observed at 500 μm of the center it was smaller than at 1000 μm in the material (A) after 10 applications; the material (A) presented smaller values of waste at 500 μm after 7 and 10 applications and at 1000 μm after 10 applications; at 500 μm after 3 and 5 applications material (A) have less waste than material (B), but it didn't differ from material (C); The materials (B) and (C) presented larger waste values. In conclusion, the microabrassion with Whitness and Opalustre materials have the largest waste values, and could be recommended for deciduous teeth.
Conclusion: The phosphoric acid didn't present values of waste, suggesting new studies with this material. The materials promoted pattern of conditioning type I and II. And the OCT technique was able of mensurar the waste promoted in the substratum, and could become an important clinical tool in the control of waste of dental enamel.

#143

INVESTIGATION OF DENTAL HARD TISSUE AFTER Er:YAG LASER IRRADIATION

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Background: The purpose of this study was to investigate the dental hard tissues morphology after Er:YAG laser-assisted treatment using *en-face* Optical Coherence Tomography (OCT) and Scanning Electron Microscopy (SEM) analysis.
Study: Thirty single- and multi-rooted freshly extracted human teeth free of caries were used in this study. All teeth were randomly divided into two study groups, group I (laser) and group II (control). In group I, the dental hard tissues were prepared using Er:YAG laser. The laser parameters used were VSP mode, 40–320 mJ and 10–20 Hz. In group II, the dental hard tissues were prepared using conventional methods. The dental hard tissues were first investigated using en-face Optical Coherence Tomography prototype, based on transverse scanning and operating at 1300 nm. Then the samples were sectioned transversally and submitted to SEM analysis.
Results: Both investigation methods demonstrated qualitatively the surface morphology after Er:YAG laser-assisted treatment, which was considerably more suitable for filling as compared to the control group, in which the dental hard tissues were prepared conventionally.
Conclusion: The en-face OCT method provided a superior non-invasive, in depth and real time investigation method, while the SEM analysis offered more accurate surface information. Moreover, based on the results of both investigation methods, it may be concluded that Er:YAG laser-assisted treatment provides an improved surface morphology of the dental hard tissues.

#144

FTIR SPECTROSCOPY MONITORING CHEMICAL CHANGES IN ENAMEL, DENTIN AND BONE DUE TO LASER IRRADIATION

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Background: Lasers emitting in the 3 micrometers region are strongly absorbed by hydroxyapatite and water.of biological tissues. When these lasers irradiate dental hard tissue they can change its chemical and crystallographic properties. In some laser irradiation conditions the resulting surface can be chemically more resistant or harder depending mainly on the temperature reached due to laser action. So it is important to know any chemical changes in order to avoid possible undesired ones. Laser irradiation has been considered a promissory alternative for caries prevention, which was firstly suggested with the use of carbon dioxide lasers. Infrared lasers have also the ability to cut bone tissue with less mechanical damage and more defined cut borders than drill. This study used the Fourier Transform Infrared Spectroscopy (FTIR) in order to monitor the chemical changes in enamel, dentine and bone after Er:Cr:YSGG laser irradiation.

Study: 10 samples of human enamel, 10 samples of dentine, and 10 samples of rabbit bone were cut in blocks of 3×3 mm and were polished down to 100 micrometers thick. All samples were analysed by Attenuated Total Reflection- FTIR (ATR-FTIR) before and after Er:Cr:YSGG laser irradiation. During irradiation samples were positioned in a motorized translation stage to assure uniform irradiation and avoid pulse overlapping. The area under phosphate (1030–1150 cm^{-1}), amides (1680–1200 cm^{-1}), water (3600–2400 cm^{-1}) and carbonate ($\sim$875 cm^{-1} and 1560–1410 cm^{-1}) bands were calculated and normalized. All data analysed by ANOVA/Tukey test at 5% significance.

Results: It was observed under specific irradiation conditions, for all tissues that there was a significant decrease in the water content, amides I and III. It was also observed increase in the FWHM of carbonate and phosphate bands, indicating crystalline changes. The dentin showed different composition depending on the direction of tubules.

Conclusion: The results presented indicate that FTIR is an efficient method to determined chemical changes in irradiated samples.

#145

Er:YAG LASER AND ADHESIVE DENTISTRY: STATE OF THE ART

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Background: Er-YAG laser, due to its affinity for hydroxyapatite and water, is -at the moment- the adequate wavelength able to prepare dental cavities.

Study: The aim of this lecture is to analyze and discuss the: ablated volume (dentine, enamel) via SEM and interferometric observations and quantification, results in terms of superficial modifications of healthy enamel and dentine (enamel micro-cracks, dentine microhardness) as well as in case of carious decays; results, once more, in terms of adhesion (mechanical properties, microleakage) of composite resins; possible re-treatment in case of unsatisfactory composite resin restorations.

Results:

Conclusion: Some clinical observations will illustrate the protocols based on those previous results used in a university hospital.

#146

308 nm EXCIMER LASER FOR THE TREATMENT OF ORAL LESIONS: A PILOT STUDY

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Background: We aimed to implement the use of a 308-nm excimer laser to treat oral T-cell mediated conditions, such as cutaneous GVHD, oral autoimmune bullous diseases, and oral lichen planus. We hypothesized that UVB effects on lesional T-cells will improve these lesions and treatment of oral lesions will be well tolerated with little to no adverse effects. Historically, oral lesions associated with these conditions are quite symptomatic and can present with pain and burning, that at times could significantly compromise patient nutrition. Patients are often prescribed a mouthwash or oral gel with anti-inflammatory, antibacterial, antifungal, or anesthetic agents. The effects of these agents are minimal at best. Currently, there is not one therapy that consistently and effectively alleviates symptoms or induces lesion resolution. Since the oral cavity is an area which poses a challenge to conventional phototherapy, the ability to deliver UVB in a targeted and lesion-specific manner becomes even more valuable for oral mucosal lesions.

Study: Subjects received 200 MJ/cm^2 dose with an excimer 308 nm laser fitted with a light delivery system for intraoral lesions to three treatment areas at the first visit. The treatment was repeated at 48 hour intervals for a total of three treatments. The dose was increased by 100 MJ/cm^2 at the two following visits until a maximum dose of 400 MJ/cm^2 was achieved. The lesions were evaluated via a five point scale and photographed at all visits. Patient symptoms, food diary, and response were documented.

Results: Four patients have completed our protocol thus far. All patients showed improvement in erythema, ulceration, edema, and pain in treated areas. Follow-up visits showed continued improvement from baseline in treated areas at 14 days and one month post-treatment.

Conclusion: There have been no adverse events, no subject complaints, and no pain with treatment. We plan to treat a total of 10–15 patients with this protocol. This therapy will provide a much-needed solution to the problem of oral mucosal conditions for which there is no current treatment to induce sustained lesion resolution.

#147

THE PERFORMANCE OF SHORT LINGUAL FRENULUM SURGERY BY TWO DIFFERENT LASER WAVELENGTHS: A CLINICAL COMPARATIVE STUDY

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Background: The tongue is an important oral structure that affects speech, the position of teeth, periodontal tissue, nutrition, swallowing, nursing, and certain social activities. Short lingual frenulum limits the range of motion of the tongue, impairing its ability to carry out its functions. The consequences of not treating improper tongue function can also influence face development and dental therapy. Malocclusion as lateral posterior cross-bite and anterior open bite can be one of this consequences. To evaluate