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EARLY CANCER DETECTION USING IN VIVO FLUORESCENCE: AN ALTERNATIVE TO SURGICAL BIOPSY

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Purpose: To develop a fast, reliable non-invasive modality for the clinical early detection and diagnosis of dysplasia and malignancy.
Methods: In 300 hamsters with healthy and dysplasic cheek pouches, topical ALA, 5-aminolevulinic acid (20% ALA in Eucerin cream, pH 5.5) was applied to produce PpIX fluorescence. In 100 animals ultrasound at 1 or 3 MHz with a total intensity of approx. 0.3 W/cm^2 was applied to cheek surfaces for 30 seconds prior to sacrifice 20–180 minutes later. In another 100 animals, 20% ALA in OPLO (Oral Pluronic Lecithin Oranogel) was applied topically to the cheek pouches prior to sacrifice 20–180 minutes later. In the control group, 20% ALA in Eucerin only was applied prior to sacrifice 20–180 minutes later. Directly after sacrifice, cheek pouch tissues were excised then frozen in liquid nitrogen. Routine 6 um cryosections were used for fluorescence measurements and histological evaluations to determine optimum acceleration modality and any potential effects of this modality on diagnostic sensitivity and specificity. **Results:** Dissolving ALA in OPLO prior to its application to the cheek pouches did not significantly ($p < 0.05$) affect time-based fluorescence development in healthy, dysplastic and malignant tissues. Ultrasound at 1 and 3 MHz significantly ($p < 0.05$) affected time-based fluorescence development in healthy, dysplastic and malignant tissues. As soon as 20 minutes after application of ALA and ultrasound at 1 MHz strong PpIX fluorescence was visible, compared with the 180–240 minutes currently needed to achieve comparable fluorescence development. **Conclusion:** The use of low-frequency ultrasound is a promising new modality for accelerating LIF-based detection of oral neoplasia.
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EARLY DETECTION OF ORAL DYSPLASIA AND MALIGNANCY USING HYPERICIN INDUCED FLUORESCENCE

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Purpose: The objective of this investigation was to examine the use of laser-induced fluorescence and hypericin for non-invasive detection of oral dysplasia and malignancy in the cheek pouch model of the Golden Syrian hamsters. **Methods:** Hypericin characteristically fluoresces at 580–630 nm after excitation at 530–580 nm. Conventional DMBA (9, 10-Dimethyl-1, 2-Benzanthracene) carcinogenesis was applied thrice weekly to one cheek pouch in forty hamsters for zero to twenty weeks. The non-treated cheek pouch served as healthy control. After hypericin application with durations ranging from ten to two hundred forty minutes, the animals were sacrificed and cheek pouch tissues were flash frozen in liquid nitrogen. Six um cryo-sections were evaluated using quantitative low-level fluorescence microscopy and semi-quantitative histological analyses. Excitation occurred at 530–580 nm, detection at > 600 nm. **Results:** Significantly stronger red emissions ($p < 0.05$) from surface and deeper tissue levels were measured in neoplastic tissues than in healthy and dysplastic samples. **Conclusion:** Thus, laser-induced fluorescence after tissue exposure to hypericin may provide a novel, precise, non-invasive tool for the early detection and diagnosis of oral dysplasia and malignancy.

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EFFECTIVE TREATMENT OF MEDICAL COMPROMISED PATIENTS WITH COMBINATION OF Er:YAG, DIODE AND Nd:YAG LASER IN DENTAL AND MAXILLOFACIAL SURGERY

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In clinical praxis we must treat patients with some relative or absolute contraindications every day. Need of hospitalization, antibiotics and hemostyptics make dentoalveolar and maxillofacial surgery in those cases quite expensive. Combination of Nd:YAG or diode and Er:YAG lasers gives us new possibilities. We can help some previous untreatable patients or transfer care from hospital to dental office thanks of replacing special treatment protocol to conventional. In the center of our work are disorders of blood coagulation (group I), immunity (group II) and metabolism (group II) six years. We were interested about patients after organ transplantations especially. But in fact we treated 225 patients with some type of relative or absolute contraindication:104 in group 1(see up), 46 females and 58 males. 38 in group 2 (see up), 22 females and 16 males. 83 in group 3, 60 males and 23 females. Nd:YAG laser had rate of clinically important complications 2,6; 9,5; 4,7 (in different groups) compare 38; 6,3; 30 (Er:YAG laser). No lethal complications in both groups. Nd:YAG laser is very useful in coagulation and vaporization of dental gum hypertrophies, benign and malign tumors even in case of chronic anticoagulation and immunosupress therapy/transplantation of heart/. Nd:YAG laser or alternatively 980 nm diode laser is very safe, cheap (7USD per surgery) and we think he is now the therapy of first choice for majority of medical compromised patients. Er:YAG laser can't solve big lesions because of minimal invasivity and he is only alternativative method for exceptional cases.

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GINGIVAL HEALING AFTER GINGIVECTOMY PROCEDURE AND LOW INTENSITY LASER IRRADIATION. A CLINICAL AND BIOMETRICAL STUDY *IN ANIMA NOBILE*

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Low-intensity laser therapy (LILT) has been used in many experiments since the sixties to examine the influence of laser radiation on the healing process of wounds. Despite a large number of studies published in the literature, results are frequently conflicting. The purpose of this study was investigate the gingival healing after gingivectomy procedure. Ethical approval was granted by the University of São Paulo, Dentistry School's Research Ethics Committee. For the present study seven patients presenting periodontal disease were selected in a way that they required the performance of gingivectomy procedure in the region of premolars in both sides, being this in the upper or lower region. After the surgical procedure one side was submitted to low intensity laser radiation, wavelength 685 nm, power 50 mW and fluency of 4 J/cm^2, contact mode. The other side was used as a control, not receiving any laser irradiation. Healing process for both sides, was clinically and biometrically evaluated and compared using photographs for the periods: pre-operatory, immediate post-operatory, 3, 7, 14, 21, 28 e 35 days. The analysis was performed by 3 specialists in Periodontology considering aspects of healing. Results were submitted to statistical analysis. Biometrical evaluation showed improvement of healing for the period of 21 and 28 days in the lased group ($p < 0,1$). Clinical evaluation showed better reparation mainly after the third day for the active group. Laser group was considered to present an improved healing when compared to the control group.