

# Laser Congress 2001

## ABSTRACTS

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European Society for  
Oral Laser Applications  
ESOLA**

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DGL**

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EUROPEAN SOCIETY FOR  
ORAL LASER APPLICATIONS





## **P14**

### **SEM Evaluation of the Effects of ND:YAG, ER:YAG, Diode Lasers on Dentin**

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**Purpose:** The aim of the study was to compare the morphologic changes in dentin irradiated by three different Lasers, Nd:Yag, Er:Yag, Diode and to examine the ultrastructure of lased areas by SEM.

**Materials and Methods:** A total of 60 human extracted teeth were used in this study. Teeth were divided into six groups of ten each; the first two subgroups were prepared by Nd:Yag with an energy level of respectively 1 W and 2 W at 10 Hz; other two groups by Er:Yag with an energy level of 2 W and 3,4 W at 10 Hz; the last two groups by Diode laser with an energy level of 1 W in continuous-wave and 2 W at 10 Hz. The teeth were sectioned at a thickness of 2 mm transversally and the slices were evaluated by SEM.

**Results:** Teeth slices showed in all cases the absence of undesirable thermal effects such as surface cracking or carbonization. Teeth treated by Nd:Yag and Diode lasers showed vitrified aspect of dentin with close dentinal tubules, whereas the use of Er:Yag showed exposed tubules free of debris with an evaporated smear-layer.

**Conclusion:** The different aspects of dentin treated by three Lasers let us to understand the different clinical answers and uses.

## **P15**

### **Relationship between Mineral Composition and Hardness of the Human Dental Treated with Short Pulsed Nd:YAG Laser in Caries Prevention**

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Various laser systems have been used in treatment of hard tissue with efficiency and safety. The action of the Nd:YAG laser in caries prevention has been reported for many research groups. Caries is a bacterial disease that affects a significant part of world population, causes minerals reduction and may lead to a total loss of the dental tissue. The aim of this study was to evaluate the use of short pulses Nd:YAG laser in caries prevention. The dependency between physico-chemical parameters like hardness and the mineral composition of dental enamel is outlined. Thirty human enamel samples were divided into two groups. The laser used emits radiation wavelength of 1.064 nm, energy of 73 mJ per pulse and 10 ns of pulse width. X-Ray Fluorescence, SEM and Vickers microhardness techniques were used. Obtained results are consistent with other studies and indicated greater Ca/P ratio in lased groups in comparison to the unlased group. The present study suggests that the use of the Q-Switched- Nd:YAG laser in enamel surfaces contributes to increase the hardness and decrease the mineral loss by bacterial acid attack.

## **P16**

### **The effect of Low-Energy Gallium-Aluminium-Arsenide Laser Irradiation on Fibroblasts Cell Culture**

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The therapeutic effect of low-energy lasers is still controversial. The aim of our study was to assess whether the gallium-aluminium-arsenide (Ga-Al-As) low energy laser has stimulative effect in fibroblasts cell culture. The monolayer culture of L 929 cells was exposed to Ga-Al-As laser irradiation at different power with constant frequency for varying time intervals. Cell proliferation of L 929 cells after irradiation was measured by MTT assay performed on day 3 and 7 after the laser irradiation. The Ga-Al-As laser was utilized at powers