

**The interaction of two different adhesive systems with
the irradiated human dentin by Er:YAG laser**

Ramos, A.; Robles, F.; Zezell, D. M.; Eduardo, C. P.
School of Dentistry, University of São Paulo / IPEN
São Paulo – Brazil

Purpose: The aim of this study was to investigate the influence of the application of a self-etching adhesive system and a conventional adhesive system on the dentin irradiated by Er:YAG laser by using or not the acid-conditioned, primers and resin adhesives. **Material and Methods:** Thirty extracted human third molars which had been stored in 0.9% saline solution were employed in this study. In every tooth the occlusal enamel was removed using a low speed cutting machine with a diamond disc under refrigeration. The specimens were equally divided in two groups: a conventional group (G1), and a laser group (G2) and each group was then subdivided into 5 subgroups. The G2 teeth were prepared by Er:YAG laser (KaVo – Germany) with an energy level of 250 mJ per pulse and repetition rate of 2 Hz under water spray, focused from the distance of 12 mm. A self-etching adhesive system (Clearfil Liner bond 2 - Kuraray-Japan) and a conventional adhesive system (Scotchbond Multipurpose – 3M)* were then used following the protocol: G1a and G2a-Clearfil (primer +bond) ; G1b and G2b- etched with 35% phosphoric acid + primer + bond*; G1c and G2c- etched with 35% phosphoric acid + bond*; G1d and G2d- primer + bond*, and G1e and G2e - only bond*. On the following, the whole of the specimens were restored with a composite resin (Z250 – 3M). The specimens were then sectioned in slices and prepared to be observed by the Scanning Electron Microscopy. **Results and Conclusion:** In the conventional group, the best result was observed in the subgroup G1b, in which the acid conditioning + primer + bond were applied on. In the laser group the best result was observed in the subgroup G2a in which the self-etching adhesive system – Clearfil was applied on.

Acknowledgement: FAPESP; IPEN/CNEN; KaVo; 3M; ABLO.

**Dental pulp reaction after irradiation with
a frequency doubled Alexandrite laser in dogs.**

P. Rechmann, T. Hennig, P.A. Reichart*
ZMK-Clinic, Heinrich-Heine-University, Düsseldorf;
*ZMK-Clinic, Charité University, Berlin, Germany

The frequency doubled Alexandrite laser has been shown to eliminate efficiently and selectively dental calculus as well as bacteria. Aim of this study was to demonstrate the safety of this laser for removal of dental calculus with respect to the dental pulp.

Four adult Labrador dogs were treated with a frequency doubled Alexandrite laser (laboratory prototype, q-switched, fiber guided, wavelength 377 nm, pulse duration 1 μ s, pulse repetition rate 70 Hz, water cooling) to remove dental calculus. After performing a modified Widman flap procedure the buccal surface of nine teeth in the lower and upper right jaw were irradiated for four minutes per tooth. Three different laser fluences were used including fluences up to four times higher than the fluence normally required for calculus removal (1.5, 3 and 6 J/cm²). At three other sites of the right jaw deep cavities were prepared with a dental drill and filled with compomere (Dyract^R, Germany) to serve as a positive control. The teeth of the lower and upper right jaw served as controls.

Animals were sacrificed one day, one week, four weeks and six weeks after treatment. Teeth were separated, fixed in formalin and decalcified. After embedding and sectioning histological sections were stained and investigated by a blinded investigator (P.A.R.). Results concerning pulpal reactions such as inflammations will be presented and rated. Finally no acute or chronic inflammatory reaction or alterations in the odontoblast cell layer were observed even at highest fluences used. Thus irradiation with this laser is safe for the pulpal tissues.

30911