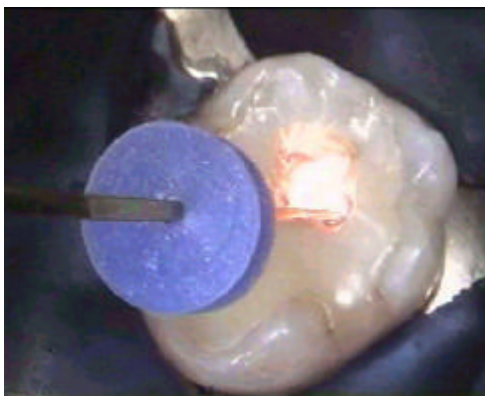


## BACTERIA REDUCTION IN THE INFECTED ROOT CANAL IRRADIATED WITH DIODE LASER.

High success rates are achieved in conventional endodontic treatment of vital pulp teeth. However, in cases of non-vital pulp, a decrease in the rate of success occurs due to difficulties in achieving a complete disinfection of the root canal system. Some bacteria, such as *Enterococcus faecalis*, are frequently found in cases of endodontic treatment failure due to their high resistance to the conventional endodontic treatment. The aim of this study was to evaluate the efficiency of a high power diode laser irradiation in bacterial reduction of contaminated canals associated with dressing composed by calcium hydroxide paste propylene glycol and camphorated paramonochlorophenol. Eighty-two root canals were infected *in vitro* with *Enterococcus faecalis* in a concentration of  $1 \times 10^8$  CFU/ml. Specimens were high intensity irradiated with a diode laser 10 W, at a wavelength of 810nm. Two different parameters were employed in continuous mode: 2W and 1.5 W with a 300 $\mu$ m optical fiber at an angle of approximately 5 degrees respect to the dentine surface during 5 seconds, in 4 applications, with 20 seconds intervals among them. After these proceedings specimens were vortexed in peptone water and dilutions performed. Aliquots of the dilution were plated on *m-Enterococcus* agar, incubated, and the Colonies Forming Units (CFU) of all groups was counted. The results showed a significant reduction of bacteria on all groups after laser irradiation. A high reduction rate was achieved: 98.5% immediately after the laser irradiation; 48 hours after, the reduction was of 96,73% and, finally, a 100% reduction was achieved through the combination of laser irradiation and a long lasting dressing of calcium hydroxide paste, propylene glycol and camphorated paramonochlorophenol. High rates of bacteria reduction were achieved using the parameter of 2W in continuous mode with the power of 2,94 KW/cm<sup>2</sup>. The temperature was monitored with a K-pipe thermocouple placed at the periapical point which width measured 1 mm, approximately. The maximum temperature variation was 7.45°C. Under electron microscope scanning, the control groups showed areas with *smear layer* covering the dentinal walls. The laser irradiated groups showed a smooth, uniform, clean appearance, with large areas of closed dentinal tubules without cracking alternately with small areas of exposed open dentinal tubules. Some parts showed fusion of the dentinal mass (groups irradiated with 2W). In groups where calcium hydroxide was associated with laser irradiation remains were found over the irradiated surface and, in many parts, the dentinal tubules could not be observed. The use of diode laser in high intensity at 810nm proved to be highly efficient and able to promote reduction in the *Enterococcus faecalis* population in the infected root canal.



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