

Cavity preparation by laser energy has been already hardly studied. Among the existing lasers system, the erbium provides good interaction with hard tissues, without any damage to the surrounding tissues. In this study it was analysed the micromorphological aspects of Class I cavities prepared with Er:YAG laser (wavelength 2.94 $\mu$ m). Twenty one extracted teeth were divided in three different groups and the class I occlusal cavities prepared with energy densities of 79.61, 89.57 and 99.52 J/cm<sup>2</sup>. The specimens were analysed by Optical Microscopy (OM) and also by Scanning Electron Microscopy (SEM) The OM analysis showed that the ErYAG laser is an effective instrument regarding the ablation of dental hard tissues, creating cavities with irregular cavo-surface margins. The SEM showed that the Er,YAG caused an effective ablation in the dental enamel that showed a conditioned pattern. The remotion of the smear layer caused by the laser irradiation led to the exposure of the dentinal tubules. The Er:YAG laser caused no melting, recrystallization and alteration of the micromorphological aspect in any energy density used in the present study. During the cavity preparation it was created a conditioning pattern of the cavity walls suggesting the possibility of its use with composite resins.