Background: This in vitro study aimed to evaluate changes in optical attenuation coefficient of eroded dentine analysed by Optical Coherence Tomography (OCT) after irradiation with Nd: YAG laser and topical fluoride.

Study: The samples were protected with acid resistant varnish, with the exception of the central area of 2 mm diameter and divided into 8 groups (n = 15) and subjected to acidic cycling with citric acid solution for 20 minutes, twice a day, during 20 days. After 10 day submitted to acid challenges, each group received different treatment: control group (no treatment), fluoride group (topical sodium fluoride 2% -by 4 minutes); three laser groups irradiated with Nd:YAG emitting on contact (1 W, 0.7 W and 0.5 W mean power); and three treated groups associating the fluoride to laser irradiation. The OCT readings were performed at days: 1 prior to first acid challenge (OCT1); at day 5 (OCT2); at day 10 (OCT3); at day 15 (OCT4); at day 17 (OCT5) and at day 20 (OCT6). It was developed a homemade software to retrieve the total optical attenuation coefficient.

Results: It was observed an increase of optical attenuation coefficient among the control group and the others groups. The best result for erosion treatment was the combination of Fluoride + laser therapy (P = 0.001) with respective percent of reduction of 86 and 78% at wavelength: 810 nm vs wavelength: 630 nm) with no significant difference (P > 0.78). The optical attenuation coefficient determined by OCT proved to be an important quantitative diagnostic tool.

Conclusion: Laser nerve welding is a comparable method for nerve injuries treatment and there is no serious problems with this method.