

عنوان مقاله:

Prevention of Enamel Adjacent to Bracket Demineralization Following Carbon Dioxide Laser Radiation and Titanium Tetra Fluoride Solution Treatment:
An In Vitro Study

محل انتشار:

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نویسندگان:

Amir Hossein Mirhashemi

Sina Hakimi

Mohammad Sadegh Ahmad Akhondi

Nasim Chiniforush

خلاصه مقاله:

Abstract Introduction: The aim of this study was to assess the caries-preventive potential of carbon dioxide (CO₂) laser application in conjunction with the use of titanium tetra fluoride solution on the enamel adjacent to bracket. **Methods:** Seventy-five freshly extracted bovine incisors were used. In order to attach the brackets, the area of examination was covered with adhesive tape to limit acid etching of the entire enamel surface. Metal orthodontic brackets for upper central were bonded to all the teeth following the manufacturer's instruction. Then all the teeth were painted with 2 layers of acid-resistant nail varnish on all surfaces except the boxes area cervical to the brackets. The teeth were then randomly divided into five groups (n = 15): control group (C); laser group (L); titanium group (T); laser-titanium group (LT) and titanium-laser group (TL). The laser-titanium group was first irradiated with CO₂ laser (same as the L group) then TiF₄ solution was applied on the enamel (same as the T group). Samples in the TL group were first treated with TiF₄ solution (same as the T group) and then irradiated with CO₂ laser on the surface (same as the L group). Then, the teeth were immersed in pH-cycling solutions. After that, the amount of calcium released into the two solutions (de- and re-mineralization) was measured with an atomic absorption spectroscopy. The data were analyzed by one-way Analysis of variance (ANOVA) and Tukey test. **Results:** Calcium loss in LT, TL and T groups were significantly lower than those in the L and C groups (P < 0.05). **Conclusion:** The application of Titanium tetra fluoride 4% solution on enamel can inhibit as much as 87% of subsequent caries like lesion progression. **Keywords:** Carbon dioxide lasers Laser therapy Titanium tetra fluoride Demineralization Caries prevention

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