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เรื่อง

"ผลของคาร์บอนไดออกไซด์เลเซอร์และฟลูออไรด์วานิชต่อเคลือบเนื้อฟันแท้"

(Effect of CO_2 Laser and Fluoride Varnish on Permanent Tooth Enamel)

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Effect of CO_2 Laser and Fluoride Varnish on Permanent Tooth Enamel

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ABSTRACT

The aim of the present *in vitro* study was to evaluate the effect of fluoride varnish and CO_2 laser treatment, alone and in combination, on permanent tooth enamel properties. Caries-free human third molars were divided into five segments and each segment was assigned to one of five groups: (1) control (C), (2) fluoride varnish (F), (3) CO_2 laser irradiation (L), (4) fluoride varnish followed by CO_2 laser irradiation (FL), and (5) CO_2 laser irradiation followed by fluoride varnish (LF). Twelve teeth (n=12) were used for determine crystallographic change using X-ray diffractometer (XRD). Enamel surface microhardness (n=5) was analysed using the microhardness tester. Teeth specimens (n=4) were put into citrate buffer and subsequently the amount of dissolving calcium was determined and enamel surface (n=4) was examined using scanning electron microscopy (SEM). Artificial caries-like lesions (n=11) were created and the lesion depth was measured. XRD analyses showed that there was more fluorapatite in FL compared to any other groups. No significant difference in Vicker's hardness number among C, L, FL, and LF was found ($p>0.05$). The amount of dissolving calcium at 6 and 24 h was comparable in all experimental groups. SEM showed that there were calcium-like material deposited on the enamel surface in F, FL, and LF. A significant decrease of the lesion depth was found in F/FL/LF compared with the control ($p<0.01$). Comparison of the lesion depth among the treatment groups of F, FL, and LF showed no statistical difference ($p>0.05$). Similar results were observed in the control and laser groups. Overall, the present data suggested that the combined treatment of fluoride and CO_2 laser irradiation and fluoride varnish only have a similar inhibitory effect on caries-like formation. Therefore, the use of fluoride varnish alone is sufficient for caries prevention.

KEY WORDS: fluoride, dental enamel, demineralization, CO_2 laser, dental caries