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The effect of laser irradiation distance on bond strength of resin restorations to dentin

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Introduction: The purpose of the present study is to investigate *in vitro* the influence of Er: YAG laser irradiation distance on the bond strength of a restorative system to enamel.

Materials & Methods: Forty noncariouse human third molars were used. The samples were randomly divided into 5 groups of 10 each. A class 1 cavity with 4*7 mm diameter was prepared on each tooth. 4 groups were like this: Er: YAG laser irradiation at distance of 12 mm, 14 mm, 16 mm, and the control group. The parameter settings used were: 50 mJ of energy and 10 Hz of pulse rate, for all the specimens and emitting at 2.94 micrometer wavelength and non-contact mode for 20 s. The bonding protocol was according to the manufacturer's instructions. In control group phosphoric acid was applied for 15 s, followed by rinsing and dried with an oil-free source for 20 seconds. Two consecutive coats of Single Bond adhesion system and then adhesive was light-cured for 10 s. A hybrid composite resin was inserted incrementally in layers of 2 mm in the cavity up to the length of 10 mm, and 40 s light curing each time. After 24 hr storage in distilled water at 37°c, the specimens were cut mesiodistaly in 2mm diameter pieces. Then the samples were tested for microtensile bond strength using microtensile machine. Data were analysed by ANOVA. Multiple comparisons were done using Tukey test at 0.05 significance level.

Result: One-way analysis of variance showed no difference (Pvalue=0.69) between the groups. Multiple comparisons of the data revealed that the control group had the highest bond strength mean (mean=15.04) and the 12 mm irradiation distance showed the lowest bond strength mean (mean=13.57), but the difference was not statistically significant (p value=0.920). Bond strength means recorded in 12, 14 and 16 mm groups were statistically similar among them (Pvalue>0.05).

Biography

Sogol Saberi is studying at Laser Research Center of Dentistry (LRCD), Dentistry Research Institute, Tehran University of Medical Sciences, Tehran, Iran.

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