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The art of the light

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taking into consideration the cost and time that a laser pretreatment needs, it was concluded that the use of laser irradiation does not appear to offer a significant advantage over traditional enamel etching methods. Conventional acid etching remains the most effective and simplest technique.

31. Er,Cr:YSGG Laser Dentin Conditioning Influence on Glass Ionomer Cement Bond Strength.

Garbui BU, Azevedo CS, Zezell DM, Matos AB.

Introduction: Conventional glass ionomer cements (CGIC) chemically bonds to tooth structure. To improve it, pretreating with polyacrylic acid is recommended, however, it is not always commercially available. Dentine pretreatment with laser irradiation has been considered as an alternative method since it has also the ability of bacterial reduction, which is essential in atraumatic restorative treatment (ART). **Objective:** Evaluate the influence of Er,Cr:YSGG laser pretreatment with two different irradiation parameters on bond strength (BS) of CGIC. **Methods:** Fifty one third molars were divided into 3 groups pretreated with one of the following: (G1-control group) no pretreatment, (G2) Er,Cr:YSGG laser irradiation at 0.5W, 25mJ, 20Hz or (G3) at 1.5W, 75mJ, 20Hz. SEM evaluation (n=2) of pretreated dentine and microshear bond strength test (n=15) were performed after 24hs of water immersion. To build the specimens to microshear test, CGIC (Ketac Molar Easy Mix) was used. **Results:** Specimens of G2 presented the highest BS results (10.50MPa +/-0.84), while G3 showed the lowest value (2.94MPa +/-0.50). SEM analysis of G1 showed smear layer covered entire dentine surface, while in groups G2 and G3 opened dentinal tubules could be detected. Laser pulses could be distinguished in G2, but not in G3, suggesting that higher energy parameter can broadly disturb dentin, affecting bonding to CGIC. **Conclusion:** Er,Cr:YSGG laser dentin pretreatment at 0.5W energy parameter increased BS of CGIC.

32. Polymerization using the argon ion laser.

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The objective of this study was to verify the influence of photoactivation with the argon ion laser on shrinkage stress (SS), followed by evaluation of Vickers microhardness (VM), percentage of maximum hardness (PMH), flexural strength (FS) and flexural modulus (FM) of a composite resin. The groups were: L1- laser 200mW/10 seconds; L2- laser 200mW/20 seconds;

L3- laser 250mW/10 seconds; L4- laser 250mW/20 seconds; H- halogen light 275mW/20 seconds. Data were analyzed by ANOVA/Tukey's test ($\alpha=5\%$). The values of SS (MPa) were statistically lower for the group L3 (1.3)c, followed by groups L1 (2.7) b, L4 (3.4)a,b, L2 (3.7)a and H (4.5)a. To the values of VM there was no difference when the same time of photo activation was used, being L1= 70.1a, L2=78.1b, L3= 69.9a, L4= 78.1b and H= 79.9b. All groups showed a PMH of at least 80%. Only the group L1 showed difference in FS (MPa) and FM (GPa), 86.2 and 5.4 respectively, being lower. The use of argon ion laser had influenced the composite resin polymerization. The L3 group presented adequate mechanical properties and minimum SS, reducing the clinical working time for photo activation of restorations with the tested resin in 50%.

33. Influence of different lasers irradiation, associated or not to fluoride, on root caries prevention.

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This study evaluated the parameters of different lasers (Er:YAG, Nd:YAG and CO₂), associated or not to fluoride (F), on root dentin caries prevention. A total of 88 dentin samples obtained from 44 human molars were randomly divided in 8 groups: 7 experimental (n=11) and 1 control (no treatment). A 9mm²-area (3mmX3mm) was irradiated (scanning mode) as follows: G1- F application; G2- CO₂- 2W, no water cooling; G3- similar to the G2, after F application; G4- Nd:YAG- 0.5W/10Hz, no water cooling; G5- similar to the G4, after F application; G6- Er:YAG- 60mJ/2Hz; water flow (2.0mL/min); G7- similar to the G6, after F application; G8 – control. The samples were subjected to a 2-week cariogenic challenge (pH cycling), consisted of the daily immersion in de-remineralizing solutions for 6 and 18h, respectively. Then, the specimens were sectioned (150µm), polished and analyzed in light microscopy. The demineralized area was measured (%) and the groups were compared to G8. Data were submitted to ANOVA and Tukey tests ($\alpha=5\%$). The percentage of demineralization on G1, G2, G3 and G7 did not differ significantly from G8. However, G4, G5 and G6, when compared to G8, presented better results, because the demineralized area was lower in 38.48%, 49.87% and 54.03%, respectively. The findings of the present study suggest that laser irradiation can promote a caries preventive effect, especially with Nd:YAG and Er:YAG. Furthermore, there was no synergism of the prior application of fluoride.