Effect of Er:YAG laser enamel conditioning and moisture on the microleakage of a hydrophilic sealant

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ABSTRACT
For a given sealant, successful pit and fissure sealing is principally governed by the enamel conditioning technique and the presence of moisture contamination. A new generation of hydrophilic resin sealants is reported to tolerate moisture. This study investigates the impact of Er YAG laser preconditioning and moisture contamination on the microleakage of a recent hydrophilic sealant. Occlusal surfaces of extracted human molars were either acid etched (n = 30), or successively lased and acid etched (n = 30). Ten teeth from each group were either air dried, water contaminated, or saliva-contaminated prior to sealing with UltraSeal XT hydro. Samples were inspected for penetration of fuchsin dye following 3000 thermocycles between 5 and 50 C, and the enamel sealant interfaces were observed by scanning electron microscopy (SEM). Significant differences in microleakage were evaluated using the Mann Whitney U test with Bonferroni adjustment (p = 0.05). Laser pre-conditioning significantly reduced dye penetration irrespective of whether the enamel surface was moist or dry. Microleakage of watercontaminated acid etched teeth was significantly greater than that of their air-dried or salivacontaminated counterparts. SEM analysis demonstrated good adaptation in all groups with the exception of water-contaminated acid etched teeth which exhibited relatively wide gaps. In conclusion, this hydrophilic sealant tolerates the presence of saliva, although water was found to impair its sealing ability. Laser pre-conditioning significantly decreases microleakage in all cases.