Effectiveness and efficiency of chemo-mechanical carious dentin removal

Sultan Ali Alanazi
Al-Farabi College for Dentistry and Nursing, KSA

The aims of this in vitro study were both to determine the time necessary for removal of carious dentin (efficiency) and the knoop hardness number (KHN) of the remaining dentin (effectiveness), using a chemo-mechanical method (carisolv) or hand excavation. 30 human molars were bisected through occlusal carious lesions into two equal halves. Each half was randomly excavated by hand in circular movements with a spoon excavator or using carisolv gel according to the manufacturer's instructions. The duration of carious dentin removal was recorded. Tooth sections were resin-embedded, ground flat and polished. Dentin KHN was determined at distances of 100, 200, 300, 400 and 500 µm from the cavity floor. Data were analyzed by Wilcoxon's test (α=0.01), ANOVA and Student's t test (α=0.05). The median of the time necessary for chemo-mechanical excavation was significantly greater than for hand excavation. KHN mean (±SD) at 100, 200, 300, 400, 500 µm for chemo-mechanical method were, respectively: 15.6 (±4.96), 18.0 (±6.22), 21.3 (±9.30), 24.3 (±9.25), 28.5 (±11.80) and for hand excavation were: 21.2 (±10.26), 23.4 (±9.49), 28.2 (±11.62), 31.0 (±12.17), 34.3 (±11.95). It may be concluded that hand excavation presented higher efficiency and effectiveness than chemo-mechanical excavation.

mr.night3@gmail.com

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