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Effectiveness and efficiency of chemo-mechanical carious dentin removal

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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 m 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.

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