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Abstract

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The aim of this study was to determine the cutting ability of chemical vapor deposition (CVD) diamond burs coupled to an ultrasonic dental unit handpiece for minimally invasive cavity preparation. One standard cavity was prepared on the mesial and distal surfaces of 40 extracted human third molars either with cylindrical or with spherical CVD burs. The cutting ability was compared regarding type of substrate (enamel and dentin) and direction of handpiece motion. The morphological characteristics, width and depth of the cavities were analyzed and measured using scanning electron micrographs. Statistical analysis using the Kruskal-Wallis test ($p < 0.05$) revealed that the width and depth of the cavities were significantly greater when they were prepared on dentin. Wider cavities were prepared when the cylindrical CVD bur was used, and deeper cavities resulted from preparation with the spherical CVD bur. The direction of handpiece motion did not influence the size of the cavities, and the CVD burs produced precise and conservative cutting.

Keywords : Dental cavity preparation; Ultrasonography; Diamond; Dentistry; Operative.

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