COMMENTARY

THE USE OF CVD DIAMOND BURS FOR ULTRACONSERVATIVE CAVITY PREPARATIONS: A REPORT OF TWO CASES Dr. Joel Berg, DDS, MS*

Navarro's presentation of two well-documented cases demonstrating the use of the new chemical vapor deposition (CVD) diamond deposition technology, combined with the use of an ultrasound handpiece, provides important information for conservative restorative dentistry. As stated articulately in the article, there are many advantages to this technology. The CVD process significantly reduces the amount of diamond particle loss after use. Sterilization is apparently easier and more likely to be achieved because of the lack of gaps where the steam or other sterilizing vapor cannot penetrate. This improved benefit regarding sterilization warrants a study in itself—if this can be carefully documented, it is believed that CVD will gain increased use for this reason, combined with the prolonged life of the burs.

Because of the precise mechanism of energy delivery to the tooth structure, these cases pictorially show how very small preparations can be achieved with minimal unintentional removal of unaffected tooth structure. In Figure 4, it can be observed that the surface of the Black Class III cavity preparation made with the CVD bur and ultrasonic handpiece is intact, while the bur has removed the soft caries-affected tooth structure beneath, going in the direction toward the dentin, while making only a very small access from the labial aspect. The tooth was restored with a resin-modified glass ionomer, an ideal choice when the preparation in this permanent tooth is small, and the issues of esthetics and strength of the material are minimized. The advantages of glass ionomer materials might be implemented more commonly in cases where this CVD/ultrasound cavity preparation is used.

As we see with any new device that allows exceptionally conservative cavity preparation, we must more frequently ask the question "does the tooth need to be cut at all?" Clearly it did in the cases presented. Yet there are a variety of ways in which we can be conservative in cavity preparation outside of using the CVD/ultrasound method. Very small burs, preferably assisted by the use of magnification,¹ have been shown to be quite effective in achieving similar results. Air abrasion, with its inherent advantages and disadvantages, has been touted as an appropriate way to create "defectspecific" cavity preparations. Advocates of lasers claim that they, too, can achieve "minimally invasive" cavity preparations, even without the use of anesthesia. Whether all of these devices and techniques' claims are correct must be tested by experts and affirmed by practitioners who use them. Having said it, it is clearly better to "cut small" than to "cut large." Removal of as little tooth structure as possible in any scenario is the best choice.

The CVD/ultrasound handpiece has also been suggested to offer the advantages of reduced "patient invasivity," because of reduced noise, and the potential for avoiding the need for local anesthesia in some cases, as a result of reduced frictional heat generation. This indeed might prove useful for many patients, particularly children.

Further studies of this CVD bur use should be carried out also to affirm the precision of the removal of healthy versus affected tooth structure. In the meantime, the cases presented here show us another alternative in conservative cavity preparation.

REFERENCE

1. Friedman M, Mora AF, Schmidt R. Microscope-assisted precision dentistry. Compend Contin Educ Dent 1999;20(8):723-8.

*Professor and chair, Department of Pediatric Dentistry, University of Washington School of Dentistry, Seattle, WA, USA

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