

The Occlusal Caries Biopsy Helps Preserve Teeth

Van B. Haywood, DMD, and Ray Jeter, DMD [October 18, 2017](#)



Are you under-diagnosing or over-treating occlusal caries, or delivering conventional posterior composites when you feel a sealant alone is not the answer? The way we now diagnosis occlusal caries has changed radically from the method dentists used for decades.

Accurate diagnosis of the pit and fissure status, from stains and simple non-coalesced deep grooves to dentin caries that undermines enamel in a fluoride-affected tooth, has become a real challenge for the astute clinician. Largely due to fluoride, the “explorer stick” method is no longer valid or predictable. Fluoride is making enamel harder and more acid resistant.

In the past, when caries progressed beyond the enamel and into dentin, the enamel would demineralize, weaken, and collapse. Hence, caries could be diagnosed with an explorer stick. Now that the tooth is harder, caries progresses into the dentin, but the enamel is not so significantly weakened that there is an identifying explorer stick in the presence of caries.

Most clinicians have witnessed teeth with significant caries that by outward appearance were minimally affected by caries and radiographically ambivalent. That phenomenon means

dentists may be missing occlusal caries while attempting to provide conservative restorative care.

Now the teaching for the evaluation of occlusal caries is visual, utilizing the International Caries Detection and Assessment System. Examining the tooth wet and dry gives indications of the potential presence of caries or lack thereof. If there is any indication of caries based on discoloration and other morphological characteristics, then a “caries biopsy” is performed.

The Caries Biopsy

When confined to enamel, this procedure, which is between a traditional sealant on unprepared etched enamel and a conventional posterior composite, is coded by the ADA as a Preventive Resin Restoration (PRR), with the code D1352. The PRR is different from a sealant, as a sealant does not require preparation of any portion of the tooth other than cleaning and etching.

To explore the depth of a groove or pit, a caries biopsy uses a small bur such as a friction grip high-speed 1/4 round or needle-nose diamond to determine if the questionable areas get worse or better. If the fissure and caries disappear while still in enamel, then the grooves created in the biopsy are restored with a flowable composite, thus the PRR. If the fissure and caries extend into dentin, then a conventional posterior composite (D2391) is placed after the caries and the dentin is removed.

So why not just automatically prepare all grooves into dentin? You don't want to automatically extend into the dentin throughout the extent of the groove because this traditional preparation process weakens the tooth, commits the tooth to a lifetime of repeat restorations, and shortens its life.

With the flexibility of no minimum bulk requirement for composite resin, you only extend into the dentin where needed for caries excavation, but keep the other portions of the preparation in clean enamel. So, the preparation may extend into dentin or remain in the enamel in different areas instead of an automatic preparation into dentin when suspecting underlying caries. This preparation design allows the potential for enamel and dentin to remain intact from one side of the tooth to the other, maintaining the tooth's strength.

This conservative exploration can prevent a very frequent consequence of extending into the dentin, fracture of the adjacent marginal ridge, which in turn becomes a leak from the interproximal directly into the dentin. This fracture creates a channel for caries to progress into dentin that does not show on radiographs as a typical interproximal lesion. Additionally, since occlusion often occurs on a marginal ridge, the added occlusal stress can also fracture a weakened marginal ridge.

In the past, dentists would “watch” or complete a traditional posterior composite for these suspect fissures that do not stick. Now the recommendation is to perform a “caries biopsy” to

determine the presence or extent of the caries. This approach is far more conservative for the patient and protects the otherwise strong tooth with limited or no caries but also identifies teeth weakened by extensive dentin caries progressing over time masked and unchecked.

Dr. Haywood is a professor in the Department of Restorative Sciences at the Dental College of Georgia at Augusta University. A 1974 graduate of the Medical College of Georgia School of Dentistry, he was in private practice for 7 years in Augusta and taught at the University of North Carolina School of Dentistry in Chapel Hill, NC, in operative and prosthodontics for 12 years before coming to Augusta University in 1993. He can be reached at vhaywood@augusta.edu.

Dr. Jeter teaches and practices at the Dental College of Georgia. He earned his DMD from the Medical University of South Carolina. He also completed an Advanced Education in General Dentistry program and became a diplomate of the Federal Services Board of General Dentistry. He is presently board certified by the American Board of General Dentistry and a Fellow of the International College of Dentists. He preceded his work at the Dental College of Georgia with a 30-year career in the Air Force. He can be reached at rajeter@augusta.edu.