COMMENTARY

INTERACTION OF PEROXIDES WITH AMALGAM: A CASE REPORT

Van B. Haywood, DMD*

The authors have contributed an interesting case report to the literature on bleaching and interactions with different materials. It is good for the profession to use peer-reviewed literature to heighten consciousness on dental situations. Ultimately, the better evidence will come from controlled research, while case reports give indications of the direction the research should pursue.

While they have several hypotheses for this staining of the tray coincident with an amalgam restoration that include a chipped amalgam, I want to elaborate on all the possible considerations of the occurrence of staining of the bleaching tray.

1. The brand of the amalgam. Because the staining occurred in the molar areas and not in the premolar area, we cannot assume that these are the same brand/type of amalgam, or placed by the same operator at the same time. The eruption dates of the molars and premolars are very different, so one possible explanation other than chipping is that one brand of reactive amalgam is in the molars and another brand is in the premolars. The observation that one is chipped may also indicate an inferior material.
2. The interaction of the thermoplastic tray material with a particular brand of amalgam. Thermoplastic tray materials are used for sports mouth guards and lining of oral appliances for sleep apnea and snoring. The figures on p. 213 demonstrate a similar occurrence of staining of the tray material coincident with an amalgam but the patient has never bleached her teeth, nor was the patient bleaching her teeth at the time of this occurrence. Whether the peroxide affects this process by accelerating the timeline of staining or whether it is merely a normal occurrence between this brand of amalgam and brand of thermoplastic material is unknown (see Figures 1 and 2).
3. pH of the patient's saliva. Dentists have experienced the phenomenon of galvanic reaction between dissimilar metals when the patient's pH is an appropriate conductor. It could be that the patient's saliva pH interacts with a particular brand of amalgam to cause it to be more reactive.
4. Diet of the patient. In the same manner as their inherent pH, dietary items such as cola drinks, yogurt, white wine, orange juice, and apple juice have a pH of about 2.6, which easily erodes enamel and can also affect metallic restorations. This low pH could also promote interaction between the amalgam and the tray material.
5. Normal body processes. The demineralization and remineralization research has revealed that brushing immediately after eating is not as desirable as waiting 30 minutes, because of the condition of the enamel. There may yet be some ebb and flow of the interaction of the tray with the amalgam, saliva, and peroxide that is occurring.

The authors have noted that this staining occurrence does not occur with other similarly chipped amalgams in other patients. The main indication for the replacement of an amalgam prior to bleaching would be because it is in the esthetic zone and may show through a translucent tooth after bleaching, or cause some greening of the tooth in an esthetic zone. In nonesthetic areas, this should not be a problem. Although replacing the amalgam with a composite alleviates the staining problem, that is not necessarily a better outcome. The composite is quite reactive and much less stable than amalgam, and may yet introduce a different set of problems.

To cover amalgams with copal finish would require daily applications, and does not seem reasonable in clinical dentistry. Given the number of patients who have bleached their teeth, and the relatively few incidences by researchers and authors of negative side effects reported, this painting approach would not justify the effort. The fact that the bleaching material penetrates completely through enamel and dentin makes sealed margins incidental to contact with the restoration internally.

DOI 10.1111/j.1708-8240.2007.00103.x

Figure 1. Thermoplastic lining to oral appliance for sleep apnea and snoring worn by patient who is not bleaching and has not bleached teeth demonstrates stains from the amalgam foundation on the molar and the MOD amalgam on first premolar due to interaction of amalgam with thermoplastic material and patient's saliva.

Figure 2. Clinical mirror-view of teeth that match one side of the appliance shows amalgam restorations on the molar and first premolar that exactly match the staining in the appliance, but no staining from the gold restoration on the second premolar in the appliance in Figure 1.

There is a word used in the article that is not generally found in US dental journals. In Europe, dentistry is under medicine, so the approach and terminology is different. The US definition for "anamnesis," compiled from Merriam-Webster Online and Dorland's Medical Dictionary, is "a preliminary case history of a medical or psychiatric patient; part of a patient's medical history in which questions are asked in an attempt to find out whether the patient has hereditary tendencies toward particular diseases."

It is good for practitioners to be aware of some of the rare outlying occurrences during bleaching in order to allay their patients concerns. These include yellowing of the tray, yellowing of the methyl methacrylate provisional, greening of the teeth, and staining of the trays from amalgams as demonstrated in this article.

**Professor, director of Dental Continuing Education, Medical College of Georgia, School of Dentistry 3255, Department of Oral Rehabilitation, 1481 Laney-Walker Blvd, Augusta, GA 30912-1260*