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COMMENTARY

EFFECT OF BLEACHING AND REPOLISHING PROCEDURES ON COFFEE AND TEA STAIN REMOVAL FROM THREE ANTERIOR COMPOSITE VENEERING MATERIALS

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The entire concept of this manuscript should stimulate a much closer look at what we really know about how esthetic restorative materials (such as composites) acquire stain. My first impression of this research project was that it was ill conceived, but I quickly changed my mind. The study begs answers to several important questions regarding esthetic changes and mechanisms of action beyond its initial testable hypothesis.

An interesting observation of many who have conducted bleaching trials of stained and discolored teeth always has been that there is a small reversion after the initial bleaching treatment.[1] Without real evidence for our interpretation, we have described the process of bleaching as affecting both acquired extrinsic and acquired intrinsic staining. For teeth, acquired extrinsic stain is relatively easy to remove and easily reforms—thus, the small reversion. Acquired intrinsic stain takes much longer to form and to remove. Other types of intrinsic staining such as tetracycline staining are deferred from the present discussion.

One can certainly apply these proposed explanations to composite restorative materials as well. Acquired extrinsic stain on composite should be a strong function of the surface finish of the material. Composites with small filler particles (microfiller) and ones that are smoothened with fine particle finishing systems will have far fewer or much smaller surface defects into which to accumulate surface stains. These trends seemed to permeate the results of this study. At the same time, composites also may permit diffusion of stains through the surface into shrinkage pores or microchannels that may exist within the restoration. The source of the staining materials (eg, coffee, tea, cola, cigarettes) should influence the extent of this effect. Importantly, the active components of tooth-whitening (bleaching) systems should be able to penetrate into the same channels and act on those stains. What the authors of this article propose is that bleaching as an alternative could be a far easier and less expensive management for discolored restorations than either replacement or veneering with new material. Little work has been conducted on understanding the time-dependent mechanisms of esthetic change over time, despite the elegance of much of the engineering that has gone into design of composite restorations.

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The authors provide an excellent introduction to their article that touches on the range of staining variables and the variety of testing situations. The present authors obviously can afford to investigate just a few of these factors. However, it would have been helpful to have more than one bleaching agent to demonstrate effects. Despite this shortcoming, the authors have stimulated us to take a closer look at this option. Many further questions remain: Does bleaching of composites for long periods of time have degradation effects? What is the real effect of repolishing procedures, abrasive dentifrice use, and powered toothbrushing on the loss of surface material of composites?

Staining experiments in dentistry have been mostly heuristic and not carefully designed. We are still left with questions about the different chemistries of staining materials from cola, coffee, tea, or other sources. Are staining solutions stable over long periods of time during experimental exposures of test materials or is the chemical composition constantly changing? Does staining occur in solutions the same way it does in the mouth where teeth undergo variable conditions of surface hydration? Do abrasive events such as food contact continually remove accumulating stain? Is there a condition of maximum extrinsic staining after which further exposure produces no more changes? Perhaps composite restorations, as opposed to actual teeth, would be good laboratory models for investigating these events.

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