COMMENTARY

EVALUATION OF FLUORESCENCE OF DENTAL COMPOSITES USING CONTRAST RATIOS TO ADJACENT TOOTH STRUCTURE: A PILOT STUDY

Stephen J. Chu, DMD, MSD, CDT*

For clinicians who practice esthetic restorative dentistry, restorative materials that are reflective of natural tooth vitality are critical to an esthetically pleasing outcome. This physical property associated with tooth vibrancy is termed fluorescence. By their very nature, teeth, and more specifically, dentin, are fluorescent because they emit visible light when exposed to ultraviolet (UV) light. Even though UV light is not visible to the naked eye, its interaction with dentin is important because fluorescence adds to the natural look of a restoration and minimizes the metameric effect. This concept is well understood in the dental ceramics industry, and agents that cause the restoration to become fluorescent have been incorporated into porcelain powders during recent decades.

Composite material behaves differently than ceramics; the former being more transparent by material design and less reflective. The development of higher-opacity dentin replacement materials has overcome problems associated with low-value areas representative of the restored area of the tooth. Studies by John Powers and colleagues have raised awareness on fluorescence as an important factor in composite resin materials. The increased vibrancy of the restoration closer to natural tooth structure is an added benefit, in addition to high translucency.

This pilot study by Dr. Luciana Assirati Casemiro is refreshing to read because it uses each tooth as its own control, meaning that the comparative fluorescence measured was the difference between the existing tooth structure and the restorative material for each individual tooth. The fluorescence of 10 commercially available composites of shade Vita A2 or equivalent was tested, and it was found that there was great variability among the different groups of materials. Some were better than others, but there existed no absolute match.

These in vitro findings not only raise the question of differentiation of product manufacturing, but also the differentiation within each product line. Because fluorescence can be thought of as visual vitality and brightness, it would be of this author's interest to see whether significant differences exist for brighter shades; more specifically, bleached shades and bleached teeth. Clearly, further research is required in this arena of esthetic material science. However, it is nice to witness that manufacturers of restorative materials are making strides in developing products that can potentially enhance the esthetic outcome of direct restorations.

**Clinical associate professor, Department of Periodontology and Implant Dentistry, and director, Advanced Continuing Dental Education Program in Post-Doctoral Aesthetic Dentistry, New York University College of Dentistry. New York Center for Specialized Dentistry, 150 East 58th Street, Suite 3200, New York, NY 10155*

DOI 10.1111/j.1708-8240.2007.00101.x