COMMENTARY

ASSESSMENT OF COLOR PARAMETERS OF COMPOSITE RESIN SHADE GUIDES USING DIGITAL IMAGING VERSUS COLORIMETER

Cathia Bergeron, DMD, MS*

The ability to predict the final shade of a composite restoration and to match it to the surrounding tooth structure is essential to the esthetic outcome of this type of restoration. The most common way to select a composite shade is to do visual assessment using a shade guide, with the assumption that the shade tabs match the corresponding composite shades.

It is also frequently assumed that shade tabs with identical designation from various shade guides will be compatible and consistent. However, the main findings of this study by Yamanel and colleagues were that composite shade guides from different manufacturers do not match well. The authors reported that 80% of the shade guide pairs evaluated with a colorimeter and digital imaging had a perceptible color mismatch. These results are not really surprising considering that Paravina and colleagues[1] as well as Kim and Lee[2] have reported poor color compatibility between pairs of composite shades with the same designations (75% mismatch and 50% mismatch, respectively). In the study by Yamanel and colleagues, it would have been interesting to add a comparison group between the shade guides from various composite systems and the Vita Classic shade guide (Vita Zahnfabrik, Bad Sackingen, Germany) because it is the most widely used.

The authors of this study clearly mentioned some limitations in the interpretation of their findings. The colorimeter measurements, for example, may have varied because of specimen geometry (curved surfaces of shade tabs) and substantial variability in the thickness of the shade tabs. Color is influenced not only by the thickness of the material but also by the optical properties of the background. Despite these limitations, this study confirms the need for better standardization of shade guides.

The shade selection of resin composite is limited not only by the lack of consistency among various shade guides but also by the poor match between shade tabs and their corresponding composite shades[3] as well as the limited selection of shades compared with the range found in human teeth. Color matching is also greatly influenced by environmental conditions, particularly the light conditions and the presence of distracting colors in the immediate surroundings. Several of these limitations can be alleviated by using custom shade guides, color-corrected lights, and neutral colors in the operatory environment.

The goal of an esthetic composite restoration is to simulate the appearance of natural tooth structure while being functional. Even though shade selection is an important part of that restorative process, it is not enough in itself to predict a successful esthetic outcome. Several other factors besides color match are essential to reach the goal of an imperceptible composite restoration:

1. Blending the composite to the tooth with adequate tooth preparation
2. Layering various opacities of composite to create a natural optical effect
3. Developing proper form and contour to match adjacent teeth
4. Finishing and polishing the composite to an enamel-like surface in terms of luster and texture

Natural-looking composite restorations can be achieved only when all of these factors are mastered by the operator.

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*Clinical associate professor, University of Iowa College of Dentistry, 801 Newton Road, Iowa City, IA 52242-1001, USA

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