COMMENTARY

Color Changes of Dental Resin Composites before and after Polymerization and Storage in Water

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As clearly introduced and discussed by Dr. Çelik in the article "*Color Changes of Dental Resin Composites before and after Polymerization and Storage in Water*," esthetic concerns for dental resin composite materials include color accuracy and stability. In the eyes of the patient, color accuracy and stability issues begin only after polymerization of these materials and continue well after leaving the dental chair, yet the clinician must be aware of the changes that occur due to polymerization and realistically inform the patient of possible future appearance changes.

The advantageous conversion of these highly moldable viscous materials into a more rigid and durable condition is unfortunately accompanied by a change in optical properties. The more basic optical properties are the optical absorption and scattering spectra, which affect[1] both color and translucency. However, the advantage of studying only color changes is that the magnitude of color change as applied to teeth and dental materials have been well studied regarding both perceptibility and acceptability, again as clearly indicated in this article. Although a more recent color difference method[2] has been recommended[3] by the International Commission on Illumination, known as the CIE from its French title, the *Commission Internationale de l'Eclairage*, the perceptibility and acceptability limits were derived based on the 1976 CIE *L*a*b** color difference formula. Therefore, the CIE *L*a*b** color difference method used in this article is the more valid and reliable method to relate the magnitudes of color difference to perception and acceptance until accurate and reliable limits can be set using more recently developed color difference methods.

Further, the attributes of this article include the incorporation of data related to the compositions of the resin composite materials studied. Potential factors influencing optical changes include the amount and compositions of the monomers, initiators, stabilizers, and pigments, but exact compositions of the materials studied are proprietary. Nevertheless, a common typing of these materials based on filler, which is more directly related to clinical usage, provides realistic expectations of the color changes of these types of materials due to both polymerization and short-term storage in water. Since water is only minimally effective in inducing color change,[4] the effects of other chemicals found in foods can only be expected to have greater influence of color stability over longer periods of time.

This article therefore not only provides good technical information regarding important issues of color accuracy and stability of contemporary dental resin composite materials, it also suggests a usable technique to account for polymerization color change and justifies that this step may be necessary to avoid unacceptable immediate results. Although Dr. Çelik only directly suggests the need for a long-term clinical study to determine the extent of color changes that will occur in clinical situations, this article nicely lays the foundation for much other needed research to relate perceivable and unacceptable changes in optical properties to the composition of these useful direct dental restorative materials.

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This commentary is accompanied by article, "Color Changes of Dental Resin Composites before and after Polymerization and Storage in Water" Esra Uzer Çelik, DDS, PhD, Akin Aladağ, DDS, PhD, L. Şebnem Türkün, DDS, PhD, Gökhan Yilmaz, DDS, PhD, DOI 10.1111/j.1708-8240.2011.00421.x.

 DOI 10.1111/j.1708-8240.2011.00422.x

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 DOI 10.1111/j.1708-8240.2011.00422.x