

Aging-dependent color changes in universal shade resin composites

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Objectives: Universal shade composites can reflect their surroundings and blend well with adjacent teeth, also known as the “chameleon effect”. As humans age, enamel becomes darker and more yellow. Therefore, it is crucial that dentists understand how aging will impact composite fillings to maintain a lasting color match with natural dentition. Objective of this study was to evaluate the impact of aging on universal shade resin composites.

Experimental Methods: Single-shade, disc-shaped specimens of five universal shade resin composites Omnichroma (OM), Filtek Universal (FU), Majesty ES-2 (KM), Admira Fusion Universal (VA) and Venus Diamond One Shade (VD) were prepared, polymerized using a curing light, and polished. A spectrophotometer was used to obtain color measurements at baseline (T₀), and after accelerating artificial aging. CIEDE2000 color differences (ΔE_{00}) were calculated. Means and standard deviations were determined, and data was analyzed by One way ANOVA. The normal data distribution was verified by the Kolmogorov-Smirnov test. Tukey's and Tamhane's tests were used for post hoc comparisons of individual pairs of materials. In addition, a 50:50% acceptability threshold (AT) of $\Delta E_{00}=1.8$ was used in result interpretation.

Results: A significant difference was recorded for time intervals T₀-T₁, T₀-T₂ ($p<0.001$, power 1.0). From T₀-T₁, materials OM, KM, and VA showed color differences below AT, while FU and VD exhibited color differences above AT. Between T₀-T₂, OM and VA stayed below AT, but composite materials FU, KM, and VD were above AT. No significant difference was recorded for T₁-T₂ comparison, and all five materials exhibited color differences below AT.

Conclusion: Within the limitations of this study, it was concluded that color differences upon accelerated artificial aging were exposure- and material-dependent. FU, KM and VD color changes were above AT after T₂, while OM and KM exhibited color stability upon aging, with color differences below AT after both aging cycles.

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