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Aging-dependent Translucency of 3D-printed Temporary Resins

Objectives: To compare the translucency parameter (TP) of five 3D-printed temporary resins exposed to accelerated aging.

Methods: Disc-shaped specimens, 10 mm in diameter and 2 mm thick, were manufactured using five 3D-printable temporary resins: Asiga DentaTooth (AD), Dentona Optiprint Lumina (DO), Pro3dure Printodent (PP), Bego VarseoSmile Temp (BV), and GC Temp Print (GC). The specimens were printed using a 3D-printer (ASIGA MAX UV) following manufacturers' instructions for printing and post-print processing. Specimens were finished using silicon carbide abrasive papers #240, #320, and #600 for 10 seconds each (EcoMet 6 grinder-polisher under water cooling) and polished using PoGo disks for 40 seconds. TP measurements were performed before and after 150 kJ/m^2 of accelerated aging, using a benchtop spectrophotometer. The CIEDE2000 translucency differences (ΔTP_{00}) were calculated. A one-way ANOVA was used to evaluate the effect of material on changes in translucency upon accelerated aging, while a Tukey's post-hoc multiple comparison test was used to assess differences among materials ($\alpha=0.05$).

Results: CIEDE2000 mean (sd) Translucency Parameter Change (ΔTP_{00}) of 3D-printable temporary resins after accelerated aging.

Materials	Aging
AD	0.24 (0.29)
DO	-0.08 (1.39)
PP	-1.33 (0.78)
BV	-0.47 (0.27)
GC	2.78 (0.21)

A statistically significant effect of the material on translucency changes upon accelerated aging was observed (p<0.001). GC presented the greatest change in translucency with aging (p<0.001).

Conclusion: CIEDE20000 Translucency Parameter (TP$_{00}$) changes upon accelerated aging was material -dependent.