Do the color and surface properties of gingival porcelains change?

Purpose: This study aimed to evaluate the effect of thermocycling on the color stability, translucency, and surface roughness of two different gingival porcelain materials.

Materials and methods: A total of 66 disc-shaped specimens were prepared using gingival porcelain powders and divided into two porcelain groups (IPS e.max Ceram Gingiva and IPS InLine Gingiva) and the three subgroups (G1, G3, and G5 colors) regarding their colors (n=11). The thermocycling was performed at 6000 cycles, simulating an oral environment of 5 years. Color and surface roughness measurements were made before and after the thermocycling. Color measurements were made with a spectrophotometer. Surface roughness was measured using a contact profilometer. The data before thermocycling were evaluated with the Kruskal-Wallis test, followed by the Dunn Bonferonni paired comparison test. A two-way ANOVA in repeated measurements and a pairwise comparison test with Bonferroni correction were used to evaluate the change in roughness and translucency parameter (TP) data between groups due to thermocycling.

Results: The color change was below the clinically perceptible color change threshold ($\Delta E00=2.1$) in all groups after thermocycling, but the increase in roughness was statistically significant ($p<05$). The roughness increase was detected in the Ceram group and was higher than in the InLine group. The change in the translucency parameters of the samples after the thermocycling was not statistically significant.

Conclusion: The roughness increase was detected in the Ceram group and was higher than in the InLine group. The change in the translucency parameters of the samples after the thermocycling was not statistically significant. Thermal cycling caused a statistically significant increase in the roughness values of the materials and a minimal increase in their translucency.

Keywords

Gingival porcelain, Thermal cycling, Color stability, Translucency, Surface roughness