SS-128 The effect of commonly used polishing protocols on the color stability of 3D- printed temporary crowns

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OBJECTIVE: Color stability is a crucial parameter for maintaining the long-term esthetic success of temporary restorations. This study aimed to evaluate the effects of different clinical polishing protocols applied to three-dimensional (3D) printed temporary resin crowns on their color stability.

MATERIALS-METHODS: Fifty standardized specimens (12×12×2 mm) were prepared using a 3D printing resin material (PowerResins, Temp Resin, A2, Turkiye) and randomly divided into five groups (n=10) as G1: Control (no polishing), G2: Mechanical polishing (DCPT 14 RA SET), G3: Silicon dioxide-containing polishing paste (Promida Prophy P), G4: Mechanical + silicon dioxide paste, G5: Diamond particle-containing polishing paste (Intensiv Unigloss). Initial color measurements were performed using a digital spectrophotometer (Vita Easyshade V). TSpecimens were exposed to a daily coffee cycle for 15 days. Color differences were calculated using the CIEDE2000 (ΔE00) formula, and the data were analyzed by one-way analysis of variance (ANOVA). Tukey's post-hoc test was applied for multiple comparisons ($p < 0.05$).

RESULTS: No significant differences were observed between the groups before the coffee staining cycle ($p > 0.05$). After staining, intergroup differences were statistically significant ($p < 0.05$). The lowest ΔE_{00} values were recorded in G5 (diamond particle- containing polish). G3 and G4 exhibited moderate color changes, comparable to the control group (G1). The highest color change was observed in G2 (mechanical polishing only), with ΔE_{00} values exceeding the clinically perceptible threshold ($\Delta E_{00} \geq 0.8$).

CONCLUSION: The diamond particle-containing polishing paste provided the best color stability both statistically and clinically. The polishing protocol plays a decisive role in the color stability of 3D-printed temporary crowns. The use of diamond-containing polishing systems is recommended, particularly in esthetic zone restorations.

Keywords: 3d printing, temporary crown, polishing protocol, color stability, CIEDE2000

SS-129 Evaluation of the effect of sintering speed and temperature on the microstructure, bend strength, and optical properties of monolithic zirconia

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OBJECTIVES: This study aimed to investigate the effects of different sintering temperatures and speeds on the microstructure, flexural strength, and optical properties of monolithic zirconia in vitro.

MATERIAL-METHODS: In this work, 90 disc-shaped monolithic zirconia blocks with the color option A2 were sintered at three different temperatures to create three groups. The samples were sanded at 300 rpm under water cooling with 600,800,1200 grit silicon carbide etching papers, respectively. Thirty pieces of zirconia material were sintered separately due to temperature and time. The sintered zirconia samples were polished with a zirconia polishing mill. The final dimensions of the disk-shaped samples were measured with a digital caliper. The normality of variables was assessed by Shapiro-Wilk, ANOVA, and LSD tests.

RESULTS: The results showed that as the sintering speed went up, the TP00 value went down; fast sintering gave the best strength, while normal sintering gave the worst; as the sintering speed went up, the CR value went up and the OP value went down; and there was a statistically significant difference in the DE2000 score between the different sintering groups.

CONCLUSIONS: In terms of clinical use, the fast sintering group can often be preferred due to its shortening of patient-side time, improved optical properties, and high bending strength.

Keywords: bend strength, cad/cam, monolithic zirconia, sintering, translucency

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