

COLOR AND TRANSLUCENCY OF MILLED POLYMETHYL METHACRYLATE CROWNS ON NON-TOOTH COLORED INTERIM ABUTMENTS WITH DIFFERENT SURFACE TREATMENTS

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INTRODUCTION

Interim implant abutments are manufactured from various materials; for narrow-diameter implants (Ø2.9–3.1 mm), titanium alloy is commonly used, particularly in anterior or premolar regions where esthetics are critical. The purpose of this in vitro study was to evaluate the effect of different surface treatments on titanium interim abutments on the color and translucency of CAD-CAM PMMA crowns.

MATERIALS & METHODS

A maxillary dentate stone cast with a narrow-diameter implant analog at the left lateral incisor site was used. Three titanium interim abutments (blue) were divided into 3 groups according to the surface treatment they received: control (steam cleaning), opaqued (120-mm Al₂O₃ airborne-particle abrasion and opaque application), and airborne-particle abraded (120-mm Al₂O₃). Thirty PMMA crowns (A2 shade) were milled (n=10). The color coordinates of the crown-interim abutment pairs and a shade tab (A2) were measured by using a colorimeter. The color differences (DE₀₀) between the crowns and the shade tab and the relative translucency parameter (RTP) values of the crowns were calculated by using the CIEDE2000 formula. One-way ANOVA was used to analyze the DE₀₀ and RTP values with subsequent Tukey honestly significant difference tests (α=.05)

INTERIM ABUTMENTS TESTED



SC Interim Abutment-crown, oval, TAN; Institut Straumann.

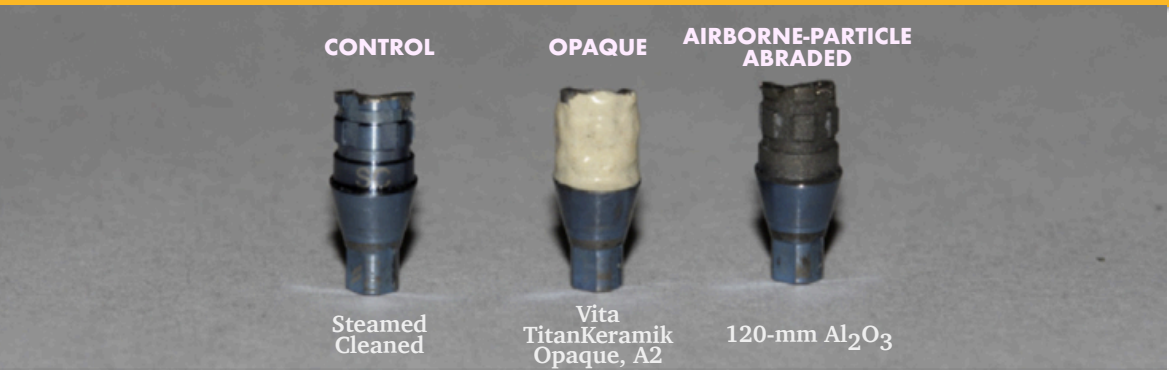
MILLING PMMA



COLOR AND TRANSLUCENCY



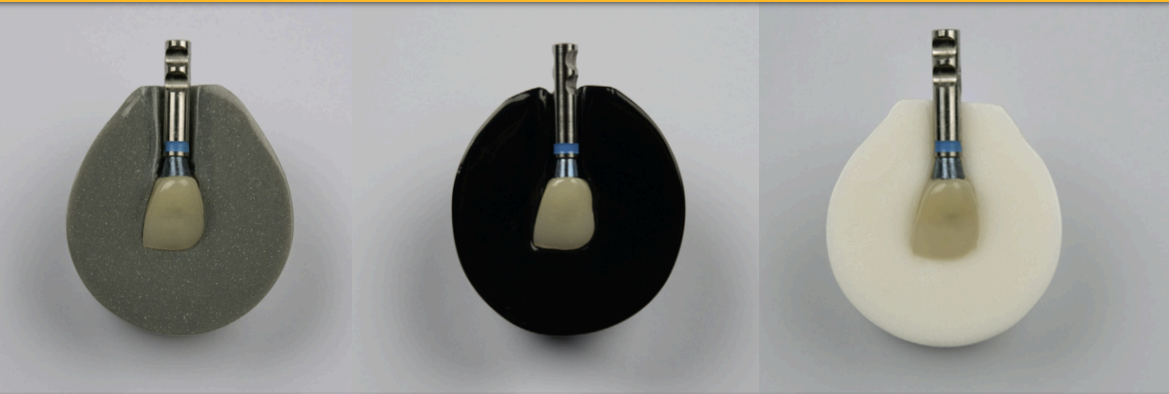
SURFACE TREATMENT



PMMA CROWNS FABRICATION

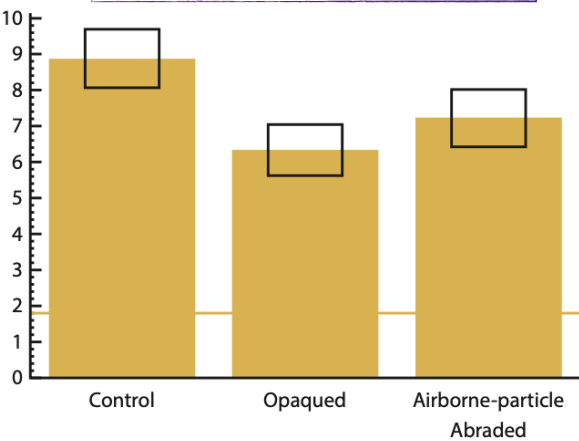


COLOR COORDINATE MEASUREMENTS

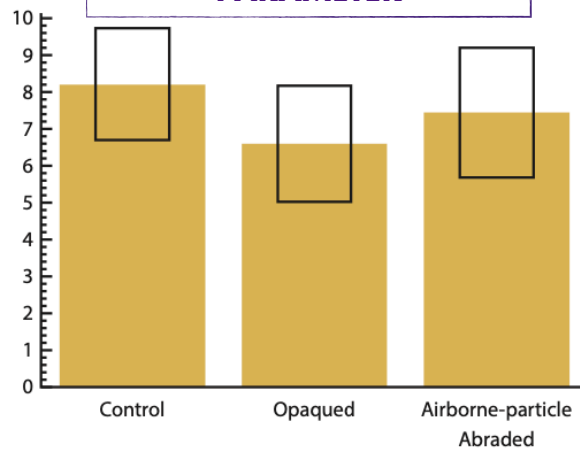


COLORIMETRIC MEASUREMENTS OF INTERIM CROWNS

COLOR DIFFERENCE



RELATIVE TRANSLUCENCY PARAMETER



RESULTS

Surface treatment significantly affected crown color (ANOVA, P<.001). Crowns on control abutments showed higher ΔE₀₀ from the shade tab than those on opaqued (P<.001) and abraded (P=.011) abutments, with no difference between opaqued and abraded groups (P=.141). L* and b* values were higher in the opaqued group (P=.03), and L* was higher in the abraded group (P=.050) compared to control. No significant differences were found in translucency (RTP, P=.26).

Color Difference between PMMA Crowns and Shade Tab

Surface Treatment	MeaΔE00 ± SDn	
Control	8.9 ± 1.14	Red
Opaqued	6.4 ± 1.01	Green
Airborne-Particle abraded	7.2 ± 1.11	Yellow

CONCLUSIONS

1. Surface treatments (control, opaqued, airborne-particle abraded) on blue TAN interim abutments altered the color of CAD-CAM PMMA crowns but not their translucency.
2. Opaqued and abraded abutments increased crown lightness; opaqued abutments also increased yellowness.
3. Although color differences exceeded clinical thresholds, crowns on opaqued or abraded abutments matched the shade tab more closely than controls.