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THE EFFECT OF THICKNESS AND ABUTMENT SUBSTRATES ON MASKING ABILITY OF TRANSLUCENT MONOLITHIC ZIRCONIA CERAMICS

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ABSTRACT

Introduction: The recommended aesthetic criteria for obtaining excellent masking ability of monolithic zirconia restoration involves the influence of abutment substrates and the thickness of the restoration factors. However, the effect of this factors on masking ability of monolithic zirconia restorations remains unclear. Hence, this study was carried out to determine the minimum thickness of monolithic zirconia to achieved acceptable masking ability and to evaluate the effects of brands, thickness and types of different substrates on colour difference. **Material and Methods:** 72 square-shaped disk specimens from 3 commercially available A2 shade translucent monolithic zirconia brands; Group HTA (Nacera® Pearl 1), Group HTB (DD cubeX^2) and Group HTC (XTCERA TT) were prepared into 3 different thicknesses (1.0, 1.5 and 2.0 mm) according to manufacturer's instruction (n:8). The specimens were placed on a D4-shade resin composite (SB) and white acrylic (control) substrate, and their CIELab values were measured with a spectrophotometer. ΔE were calculated and compared with the established acceptable (ΔE = 5.5) and perceptible (ΔE = 2.6) tolerance thresholds. Brand specimens that showed greatest masking ability were further analysed on another 2 abutment substrates, D3 shade resin composite (SA) and precious gold alloy (SC). Two-way ANOVA was used to assess the interaction of brand, thickness and types of abutment substrates on ΔE. **Results:** Acceptable tolerance threshold was achieved with combination of brand and abutment substrates of specimen's thickness; HTA-SA (1.5 mm), HTA-SB (1.5 mm), HTA-SC (1.0 mm), HTB-SB (2.0 mm) and HTC-SB (2.0 mm), while HTA-SA (2.0 mm), HTA-SB (2.0 mm) and HTA-SC (1.5 and 2.0 mm) achieved perceptible tolerance threshold. Zirconia brand, thickness and abutment substrates affects the ΔE ($P<0.001$). **Conclusion:** Within limitation of this study, acceptable masking ability of monolithic zirconia mostly could be achieved with 2.0 mm thickness. Types of abutment substrates, brands and thickness affects the masking ability of translucent monolithic zirconia.

Keywords: Masking Ability, Monolithic Zirconia, Acceptable tolerance, Perceptible tolerance, Spectrophotometry.

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