

Effect of core/veneer thickness ratio and veneer translucency on absolute and relative translucency of CAD-On restorations.

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Abstract

Statement of problem

With zirconia being chalky white in color with poor optical properties, several veneering techniques have been adopted to improve the esthetic qualities of zirconia-based restorations. Yet, these techniques didn't recommend the optimum combination of core-veneer thickness ratios and veneer translucency needed to provide the ultimate optical properties.

Purpose This in vitro study was designed to evaluate the translucency of CAD-veneered zirconia restorations through the effect of different core-veneer thickness ratios, and different translucencies of Cad-On veneer material.

Methods

Sixty CAD-On restorations were constructed and classified into 3 groups ($n = 20$) of different core/veneer thickness ratios (0.5:1 mm, 0.7:0.8 mm, 1:0.5 mm). Each group was subdivided into 2 sub-groups ($n = 10$) according to the CAD-On veneer translucency (High Translucency HT, Low Translucency LT). Cad-On restorations were constructed using the CEREC InLab CAD/CAM System. Translucency of the CAD-On restorations was measured through 2 methods; relative translucency expressed in terms of contrast ratio (CR) using Vita EasyShade Compact and absolute translucency using Unicam spectrophotometer Helios. All data was statistically analyzed and presented as mean and standard deviation values. Repeated measurements of data were analyzed with analysis of variance (ANOVA) for significant differences.

Results

There was significant difference ($P < 0.05$) only for the effect of veneer translucency over the contrast ratio values, while with the core/veneer thickness ratio and interaction between veneer translucency and core/veneer thickness ratio had no significant difference over the contrast ratio values. For absolute translucency, there was significant difference ($P < 0.05$) for the effect of core/veneer thickness ratio, veneer translucency and interaction between them.

Conclusions

Only veneer translucency had significant effect over contrast ratio values, while on the other hand, absolute translucency values were significantly affected by the core/veneer thickness ratio, veneer translucency and interaction between them. It was clear that absolute translucency measurements showed higher translucency values for the restorations than contrast ratio measurements.

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