

**TENSILE BOND STRENGTH OF CERAMICS
LUTED TO COMPOSITE RESIN CORE
MATERIALS**

Submission of research dissertation for the fulfillment of
the degree of Master of Dental Science

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ABSTRACT

Objective: The objective of this study was to evaluate the tensile bond strength of Vita In-Ceram[®] Zirconia coping Materials when luted to two different composite resin core materials with four different luting materials.

Methods: One hundred and twenty ceramic specimens (8X5mm) were fabricated from a Vita In-Ceram[®] Zirconia kit which was prepared in a ceramic dental laboratory according the manufacturer's instructions. One hundred and twenty composite resin specimens were prepared from Spectrum[®]TPH[®]3 (hybrid composite) (Dentsply, Germany) (n=60) and Composan Core DC (flowable composite) (Promedica, Germany) (n=60). The ceramic discs were divided into eight groups (n=15 for each): group 1: (Control) ceramic cemented to Spectrum[®]TPH[®]3 with Elite (GC Corp, Japan); group 2: ceramic cemented to Spectrum[®]TPH[®]3 with Fuji I (GC Corp, Japan); group 3: ceramic cemented to spectrum[®]TPH[®]3 with Calibra[®] (Dentsply, Germany); group 4: ceramic cemented to Spectrum[®]TPH[®]3 with Panavia^{TMF} 2.0 (Kuraray Med Inc., Japan); group 5: (Control) Ceramic cemented to Composan Core DC with Elite; group 6: Ceramic cemented to Composan Core DC with Fuji I; group 7: Ceramic cemented to Composan Core DC with Calibra[®]; group 8: Ceramic cemented to Composan Core DC with Panavia^{TMF} 2.0. The specimens were stored for 24 hours in distilled water at 37 °C prior to tensile bond strength testing. The data for each group were analyzed by the Kruskal-Wallis test followed by multiple pair-wise comparisons by using Mann-Whitney rank sum test for independent samples, ($p < 0.05$). Significance levels were adjusted with the Bonferroni correction for multiple testing. The fracture interfaces on each specimens were examined under a stereomicroscope to classify the mode of failure.

Results: No significant differences in tensile bond strength were found between composite resin core materials ($p > 0.05$). There was a significant difference between different luting materials ($p < 0.05$). The mode of failure for most specimens were cohesive failure.

Conclusion: The Vita In-Ceram[®] Zirconia ceramic coping when cemented to a composite resin core with Calibra[®] recorded a high mean value of tensile strength. The different composite core materials used in this study had no significant effect on tensile bond strength.

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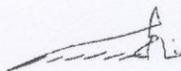


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LIST OF SYMBOLS AND ABBREVIATIONS

Abbreviation

TBS	Tensile Bond Strength
BIS-GMA	Bisphenol- a-Glycidyl-Methyl-Acrylate
HF	Hydrofluoric acid
ZPC	Zinc Phosphate Cement
MPa	Mega Pascal
GIC	Glass Ionomer Cement
H₃PO₄	Phosphoric acid
ANSI/ADA	American National Standards Institute /American Dental Association
ISO	International Organization for Standardization
EBA	Ethoxy-Benzoic Acid
EDTA	Ethylana Diamine Tetraacetic Acid
PVC	Poly-Vinyl Chloride
MJ	Modified Jig
SD	Standard Deviation
IQR	Inter-Quartile Range
Ø	Diameter
%	Percentage
Y-TZP	yttrium, partially stabilized, tetragonal zirconia, polycrystal materials