

# *In Vitro* Evaluation of Retentive Properties of Different Luting Cements on Zirconia Copings

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**Objectives:** The purpose of this *in vitro* study was to evaluate the retentive properties of zirconia copings luted with different cements against with base metal alloy copings after artificial aging.

**Methods:** Caries-free extracted 120 mandibular premolars were prepared with 6° taper. After preparation, 60 of the specimens were cast in 3Y-TZP, whereas the 60 specimens were cast in an Ni-Cr alloy. Cementation was performed with 3 different luting cements (zinc phosphate cement, Panavia F2.0, RelyX U100) in each group. Specimens were thermocycled between +5°C and +55°C for 2500 cycles, with a dwell time of 30 seconds. Dynamic loading of 10 specimens in each subgroup was performed for 100 000 cycles at 50 N at a frequency of 0.5 Hz. Vertical tensile force was applied with a constant speed of 10 mm/min until separation was noted. The data were evaluated by multivariate ANOVA and Post-hoc Bonferroni for comparing quantitative data, Pearson Chi-square Test for qualitative data ( $p < 0.05$ ).

**Results:** The highest mean retentive force for the Ni-Cr alloy copings was observed (281.10N) for PAN specimen only received thermocycle; for the zirconia copings was observed (171.40N) for ZPC specimen only received thermocycle.

**Conclusions:** Retentive force of Ni-Cr and zirconia was different each other. Also artificial aging affected retentive force and failure modes of Ni-Cr and zirconia copings differently. The mean retentive force of all cements in Ni-Cr group after dynamic loading decreased however all cements in zirconia group had similar mean retentive force values before and after dynamic loading.

**Key words:** Zirconia, Ni-Cr alloy, resin cement, retention, artificial aging