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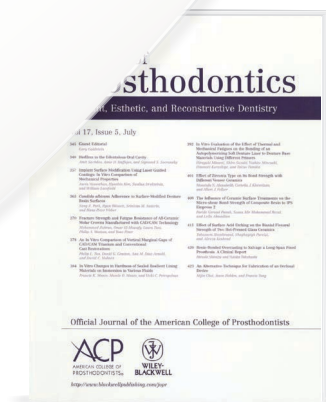
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Cement Selection for Implant-Supported Crowns Fabricated with Different Luting Space Settings”*

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ABSTRACT.

Purpose

To measure and compare the retentive strength of cements specifically formulated for luting restorations onto implant abutments and to investigate the effect of varying cement gap on retention strength of implant-supported crowns.

Materials and Methods

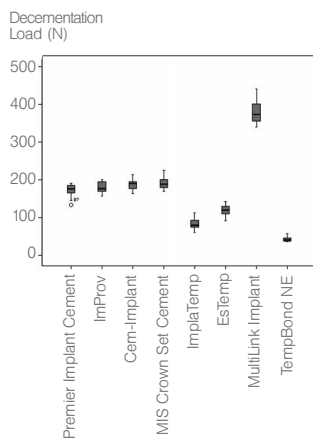
Standard titanium abutments were scanned by means of a 3D digital laser scanner. One hundred and sixty standard metal copings were designed by a Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) system with two cement gap values (20 and 40 μm). The copings were cemented to the abutments using the following eight cements with one being the control, zinc oxide temporary cement, while the other seven were specifically formulated implant cements ($n = 10$): Premier Implant Cement, ImProv, Multilink Implant, EsTemp Implant, Cem-Implant, ImplaTemp, MIS Crown Set, and TempBond NE. The specimens were placed in 100% humidity for 24 hours, and subjected to a pull-out test using a universal testing machine at a 0.5 mm/min crosshead speed. The test results were analyzed with two-way ANOVA, one-way ANOVA, post hoc Tamhane's T2, and student's t-tests at a significance level of 0.05.

Results

Statistical analysis revealed significant differences in retention strength across the cement groups ($p < 0.01$). Resin-based cements showed significantly higher decementation loads than a noneugenol zinc oxide provisional cement (TempBond NE) ($p < 0.01$), with the highest tensile resistance seen with Multilink Implant, followed by Cem-Implant, MIS Crown Set, ImProv, Premier Implant Cement, EsTemp Implant, and ImplaTemp. Increasing the cement gap from 20 to 40 μm improved retention significantly for the higher strength cements: Multilink Implant, Premier Implant Cement, ImProv, Cem-Implant, and MIS Crown Set ($p < 0.01$), while it had no significant effect on retention for the lower strength cements: EsTemp Implant, ImplaTemp, and TempBond NE ($p > 0.05$).

Conclusion

Resin cements specifically formulated for implant-supported restorations demonstrated significant differences in retention strength. The ranking of cements presented in the study is meant to be an arbitrary guide for the clinician in deciding the appropriate cement selection for CAD/CAM-fabricated metal copings onto implant abutments with different luting space settings.



Median pull-out test results for 40 μm cement gap group.

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