

Cement Bonding Study of Comparing Leading RMGI and GI Cements when bonded to Preveneered and Zirconia Crowns

Retention Strength of Different Cements on NuSmile Signature and NuSmile Zirconia Posterior Pediatric Crowns: an in vitro study

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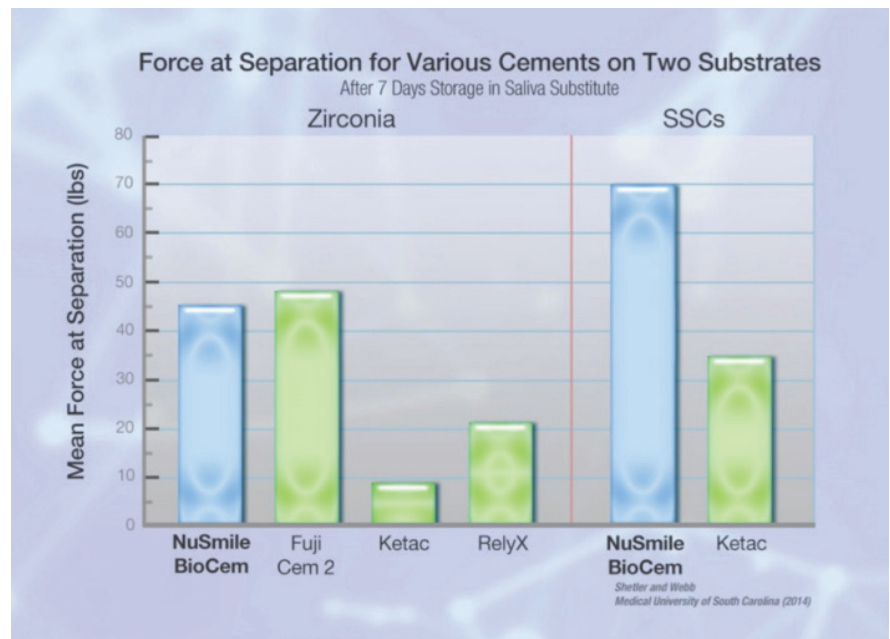
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Abstract:

Purpose: The purpose of this in vitro study was to analyze the effect of different cement types on bond strength of NuSmile Signature and NuSmile Zirconia posterior crowns.

Methods: 304 NuSmile crowns (144 Signature and 160 Zirconia) size lower right D2 (tooth #S) were tested. The Signature crowns were divided into equal groups of 72 to be tested using two different cements. The Zirconia crowns were divided into equal groups of 40 to be tested using four different cements. Both the Signature and Zirconia crowns were tested with Ketac Cem cement and NuSmile Experimental cement. Additionally, the Zirconia crowns were also tested using RelyX Luting Plus and FujiCEM 2. All of the samples were stored in artificial saliva at 37 degrees Celsius for one week post-cementation prior to testing. Two typodont teeth of a primary mandibular first molar were prepared by the manufacturer for both a NuSmile Signature and a NuSmile Zirconia crown. These prepared teeth were replicated using Luxacore core build-up composite material; 144 replicas of the tooth prepared for a Signature crown and 160 replicas of the tooth prepared for the Zirconia crown. The bond strength required to separate the crowns from the tooth replica was tested and recorded using an Ultratester by Ultradent.

Results: Using statistical analysis, we found that the Signature crown samples cemented with the NuSmile Experimental cement had statistically significant higher retention rates than the Signature crowns cemented with Ketac Cem. The Zirconia crown samples also showed statistically significant results between the four different cements, with the FujiCEM 2 demonstrating the highest mean bond strength, followed by the NuSmile Experimental cement; however, there was no statistical difference when comparing the FujiCEM 2 cement with the Experimental cement for the Zirconia crowns. Finally, the Signature crowns showed significantly stronger bond strengths compared with the Zirconia crowns when cemented with both the Ketac Cem and the Experimental cement.



Conclusions: The Signature crowns showed the highest mean bond strength rates when cemented with the Experimental cement. The Zirconia crowns showed the highest mean bond strength when cemented with the FujiCEM 2 cement and NuSmile Experimental cement, with no statistically significant difference between the two outcomes. And overall, the Signature crowns showed the highest mean bond strengths when compared to the Zirconia crowns, when cemented with either the Ketac Cem and the Experimental cement.

Note:

NuSmile Experimental Cement has been commercialized as of May 2014 under the product name NuSmile BioCem Universal BioActive Cement