Original Articles

Efficacy of Restorative Primers on the Shear Bond Strength of Polymer-infiltrated Ceramic Network to Resin Cement

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Abstract

This study investigated the shear bond strength (SBS) of polymer-infiltrated ceramic network (PICN) to resin cement by application of different restorative primers which are commonly available in dental clinic. Fifty square-shaped PICN specimens were prepared and treated with 5% hydrofluoric acid. Then, the specimens were randomly divided into five groups with different surface treatments as follows: non-chemical surface treatment as control group (C), surface treatment with Monobond N (MN), Alloy Primer (AP), Super-Bond Universal Ceramic Primer (SB), and Clearfil™ Ceramic Primer Plus (CF). The specimens were then bonded to cylindrical resin composite block with Panavia™ V5. The SBS test was performed with universal testing machine. Data were recorded and statistically analyzed by One-way ANOVA and Tamhane's T2. The mode of failure was also evaluated under a stereomicroscope at 35x. The results showed that the mean SBS values of MN, CF, and SB groups were significantly higher than that of the C group ($p<0.05$), but not significantly different to each other ($p>0.05$). In contrast, AP group provided the lowest SBS value among all the groups ($p<0.05$). The modes of failure of MN, CF, and SB groups were much preferable than that of C and AP groups. Thus, selection of restorative primers prior to cementation should be thoroughly considered due to the positive and negative effect on the SBS value of the PICN restorative material.

Keywords: Polymer-infiltrated ceramic network, Restorative primer, Shear bond strength, Surface treatment.

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Abstract

The polymer-infiltrated ceramic network (PICN) is a CAD/CAM resin-ceramic that has been developed to overcome the disadvantages of conventional dental ceramics. PICN is a structure with a sintered ceramic matrix infiltrated with a polymer matrix that provides the combination of more flexibility, less stiffness, increased softness with satisfactory flexural and fracture strength values, and decreased wear of the occluded tooth.[1,2] In the modern days, PICN has been used for the same purpose as other all-ceramic restorations due to its physical properties,