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**Comparative Evaluation of Shear Bond Strength of BioHPP- A High Performance Polymer to Dentin Using Two Different Commercially Available Luting Cements Under the Effect of two Different Surface Treatments– An In-Vitro Study**

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**ABSTRACT:**

**INTRODUCTION:** BioHPP (Biocompatible High Performance Polymer) is one variant of PEEK that has been specially optimised in the dental field, It is a partially crystalline, thermoplastic high-performance polymer. Considering the properties of BioHPP, it can be used for the fabrication of framework for FDPs, endocrowns, interim restoration after implant placement, implant abutments and implant frameworks. This study aims to evaluate the clinical application of BioHPP as crowns & bridges. As there is insufficient literature and studies to support the effect of surface treatment on PEEK-BIOHPP and evaluation of retentive property of PEEK adhesively bonded to dentin of prepared abutment, there is a need for testing shear bond strength and effect of surface pretreatment for BioHPP.


**OBJECTIVES:** To evaluate shear bond strength of CAD/CAM High-performance polymers (BioHPP) to dentin using two different luting cements under the effect of two different surface treatments, physical and chemical.

**MATERIALS AND METHODS:** Forty CAD/CAM High-performance polymers (BioHPP) discs were milled and divided into two groups according to the different cements used to lute to dentin surface. Group 1: using: RelyX U200 resin cement, Group 2: using Fuji Plus GI cement. Each group further divided into sub groups of different surface treatment one with chemically etched by piranha solution and the other with surface roughness by sandblasting with 110µm aluminium oxide particle (Group 1a and 1b, Group 2a and 2b). All the samples were subjected to shear force by a Universal Testing Machine until failure and the results in the various groups were compared and statistically analysed.

**RESULTS:** Mean SBS were as follows: Group 1:  $1.281 \pm 0.828$ , Group 2:  $0.705 \pm 0.538$  and Group 1a:  $0.844 \pm 0.43$ , Group 1b:  $1.718 \pm 0.91$ , Group 2a:  $0.284 \pm 0.23$ , Group 2b:  $1.12 \pm 0.40$

**CONCLUSION:** Resin-modified glass-ionomer (GC Fuji Plus) cement showed better shear bond strength, between BioHPP and dentin when compared to phosphate containing monomer (RelyX U200) and when physical and chemical surface treatments are compared for shear bond strength of BioHPP to dentin, using the two cements; Resin-modified glass-ionomer (GC Fuji Plus) and phosphate containing monomer (RelyX U200), physical surface treatment of sandblasting with Aluminium oxide particles of  $110\mu\text{m}$  showed better bonding in both GC Fuji Plus and RelyX U200 cement groups.

**KEYWORDS:** Polyetheretherketone, PEEK, Shear Strength, Dentin

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