

SHEAR BOND STRENGTH OF CHEMICALLY CURED GLASS IONOMER CEMENT TO DENTIN SURFACES PRETREATED WITH DIFFERENT METHODS

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Abstract:

Conditioning of dentin prior to placement of chemically cured glass ionomer cement (GIC) still represents a controversial issue for most of the clinicians. The purpose of this in vitro study was to evaluate the effect of three dentin pretreatment (water rinsing and dryness, 25% polyacrylic acid and mixed solution of 10% citric acid and 3% ferric chloride) on the shear bond strength of two commercial capsulated chemically cured glass ionomer restoratives (Ketac-Fil & Ketac-Silver). Representative samples of the different treatment groups were submitted for SEM before bonding with GIC to visually assess the resultant dentin surface morphologies. Bond strength to the control group ranged from 3.47 ± 0.54 MPa for Ketac-Fil and from 5.32 ± 0.67 MPa for Ketac-Silver. Conditioning with 25% polyacrylic acid resulted in bond strength ranged from 3.62 ± 0.61 MPa for Ketac-Fil and from 5.64 ± 0.55 MPa for Ketac-Silver. Treatment of dentin with a mixed solution of 10% citric acid and 3% ferric chloride resulted in bond strength ranged from 4.69 ± 0.78 MPa for Ketac-Fil and from 7.00 ± 0.84 MPa for Ketac-Silver. It was concluded that, the polyacrylic acid dentinal pretreatment did not enhance the bond strength of GIC to dentin significantly when compared to the untreated control group. Moreover, the mixed solution of 10% citric acid and 3% ferric chloride caused aggressive etching of the dentin as seen under the SEM, but it resulted in the highest improvement in the shear bond strength of GIC to dentin among all the tested groups. Finally, longitudinal biological and clinical studies on the effects of citric acid and ferric chloride dentinal pretreatment are recommended before being advocated for use with chemically cured GIC.

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