"COMPARATIVE EVALUATION OF THE EFFECT OF VARIOUS CLEANING METHODS ON PREPARED TOOTH SURFACES ON THE BOND STRENGTH OF GLASS IONOMER CEMENT - AN IN-VITRO STUDY"

By

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ABSTRACT

Background and objectives: The success of any cemented restoration is dependent on the success of the bond between the tooth surface and the restoration surface. The importance of a clean tooth surface prior to definitive cementation of a restoration cannot be overemphasized. It is the primary factor for good adhesion between the two materials. Contamination of the tooth surface with temporary cements is the main problem in a clinical scenario. Therefore, the aim of the study was to compare and evaluate the shear and tensile bond strength of glass ionomer cement to the dentin surface treated with different cleaning agents. In this study an attempt was made to evaluate both of them and establish the correlation between shear and tensile bond strength of the test samples prepared in the same way.

Methodology: A total of 90 extracted intact human molars prepared flat, were divided into a shear bond strength test group and a tensile bond strength test group comprising of 45 samples each. Among each test group, three further subgroups were made comprising of 15 specimens each according to which temporary cement was used. These subgroups were further split into 3 sets of 5 teeth each depending on the type of cleaning method used. A temperature controlled water bath was used, wherein all the temporized samples were thermo cycled 5000 times between 10°C ± 3°C and 60°C ± 3°C at 5 sec intervals. Bond strength evaluation was accomplished using the Universal Testing Machine. One sample from each group was subjected to evaluation under magnification (11 X) using SpeckFinder™. The debonded samples were examined for the type of failure, whether adhesive, mixed or cohesive failure. The bond failure was analyzed by ANOVA and Scheffe's multiple comparison test.

Results: Polyacrylic acid treated IRM group samples showed a maximum shear bond strength (1800gmf) with $p<0.01$, Provicol group 1490gmf ($p>0.01$) and for Zinc oxide eugenol group, no statistically significant results were obtained. Polyacrylic acid treated IRM group samples showed a tensile bond strength (1640gmf) with $p>0.01$, Provicol group 1070gmf ($p>0.01$) and for Zinc oxide eugenol group, ultrasonic scaler showed significant results (940gmf, $p<0.01$) as compared to other cleaning agents.

Interpretation and conclusion: Whenever glass ionomer cements are used as the definitive luting agents, polyacrylic acid pre-conditioning of the prepared tooth is recommended to eliminate the temporary cement remnants. When zinc oxide eugenol temporary cement is used, polyacrylic acid is not the material of choice for cleaning the dentin. IRM (Intermediate Restorative Material) is the recommended material for temporization of prepared teeth.

Key words: temporary cements; cleaning agents