

Evaluation of adhesion between composite resins and an experimental mineral restorative material.

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INTRODUCTION: The purpose of this study was to evaluate the ability of new Ca₃SiO₅ based cement, used as a base in sandwich technique restorations, to bond to restorative composite resins. Adhesion was studied by evaluating marginal microleakage and shear bond strength of samples of composite resins bonded to the experimental cement with several different surface treatments.

METHODS: A three-step adhesive system (AllBond 2®, Bisco) and a silane coupling agent (porcelain primer, Bisco) were used to bond the composite resin (Enamel plus HFO GE3, Micerium) according to 9 different procedures (n=5). The marginal seal was evaluated by the silver nitrate penetration method after 3500 thermocycling cycles at 5 and 55°C. Shear bond strengths were evaluated on samples treated according to only five procedures (n= 10) two hours after bonding. Kruskal Wallis non parametric tests and Games-Howell *post hoc* tests were used to evaluate statistical differences between the experimental groups.

RESULTS: Figures 1 and 2 summarize the results. Groups with the same letter did not differ significantly.

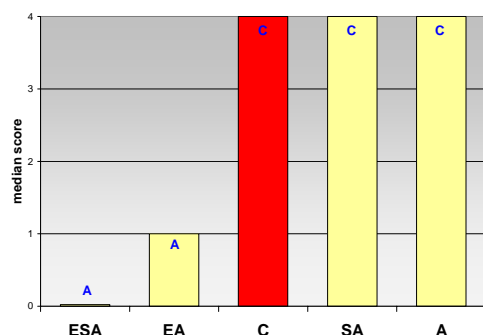


Fig1. Interfacial microleakage according to surface treatment.

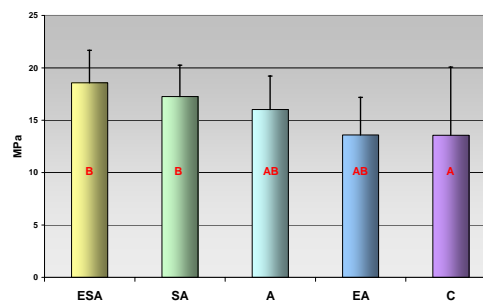


Fig. Mean shear bond strength according to surface treatment

The results presented here are those obtained with the five following procedures: control (no treatment) (C), adhesive resin (A), silane-adhesive resin (SA), etching-adhesive resin (EA) and etching-silane-adhesive resin (ESA).

DISCUSSION & CONCLUSIONS: Etching the surface of the experimental cement with a H₃PO₄ gel for 15s, then applying a silane coupling agent, before the adhesive resin, led to both the highest shear bond strength [18.57(3.04)MPa] and the lowest microleakage (median score = 0). This procedure seems to be the best when a composite resin has to be bonded to the experimental cement.

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