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Repair of aged composite with composite: Effect of different surface treatment (*In vitro* study)

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Background and aim: Repair of composite restorations is a minimally invasive approach and it can reduce cost and time of dental treatment. This study aims to compare the effect of different surface treatments (phosphoric acid, hydrofluoric acid, silane with universal adhesive) on the Shear Bond Strength (SBS) of aged repaired composites.

Materials and methods: Seventy cubic composite blocks (5 mm x 6 mm) were fabricated at teflon matrix made for this study, then aged by keeping in distilled water at 37C for 24 hours then at 55C for 4 days. Specimens were roughened by diamond bur and divided into 7 groups (n=10) according to surface treatment:(phosphoric acid 37% + silane + universal adhesive, phosphoric acid 37% + universal adhesive, universal adhesive, hydrofluoric acid 9.8% + silane + universal adhesive, hydrofluoric acid 9.8% + universal adhesive, universal adhesive, one block composite no therminal treatment for the first time (positive control), no surface treatment (control)). The conditioned surfaces of all specimens were covered with repair composite Cylinders (4mm x 6mm) and aged as previously. The shear bond strengths were measured for all specimens using a universal test machine (test 114). Data were collected and statistically analyzed by SPSS version 13 and using One way ANOVA Test. P-value of 0.05 was taken as statistically significant level.

Results: The specimens repaired with phosphoric acid 37% + silane + universal adhesive showed the highest SBS value and were significant. There were no significant differences in SBS between phosphoric acid 37% + silane + universal adhesive and universal adhesive and positive control groups ($p > 0.05$). There was no significant difference at SBS values between negative control and hydrofluoric acid 9.8% + silane + universal adhesive, hydrofluoric acid 9.8% + universal adhesive groups with the lowest SBS value.

Conclusion: For aged composite repair silane application after phosphoric acid etching and then adhesive application could enhance bonding between old and new composite restoration. Application of hydrofluoric acid for old composite restorations is not recommended.

Keywords: Composite, Restoration repair, Surface treatment, Aged composite, Phosphoric acid, Hydrofluoric acid, Silane, Universal adhesive, Shear bond strength.

Recent publications

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Biography

Thuraya Lazkani is an Associate professor and member of staff of restorative department, Dentistry College, Damascus University. She did her PhD in endodontic in Damascus university, Syria in 2009-2012; MSc in Medical Laser from High Institute of laser research, Damascus University, Syria in 2018; MSc in endodontic Damascus University, Syria in 2009; Diploma of Endodontic Dentistry in Damascus University, Syria in 2007; and diploma of pediatric Dentistry in Damascus University, Syria in 2003. She is a staff of Restorative Department at Damascus University and has her membership in General Dental Practitioners' Association and in Syrian Endodontic Society.

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