

Effect of Certain Chemical Surface Treatment on
Repaired Bond Strength of Different Heat Cure
Denture Base Materials

A Thesis

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Abstract

Fracture of denture base with different types is a common problem associated with dental prosthesis . Studies suggested that the repair strength may be improved by several means including surface treatment with chemical agents.

This study was performed to evaluate the **transverse ,tensile and shear** bond strength of different denture base materials repaired with an auto-polymerized acrylic resin following the use of different chemical solvents (monomer or acrybond-bonding agent) .

Two hundred seventy specimens were prepared from different types of heat cure acrylic . **1- 90** specimens were prepared by using the regular conventional heat cure acrylic . **2- 90** specimens were prepared by using the rapid simplified heat cure acrylic. **3- 90** specimens were prepared by using the high impact heat cure acrylic. Specimens were fractured and repaired with cold cure acrylic resin . In each group the specimens were subdivided into 3 groups according to the surface treatment: **1- Control group without surface treatment. 2- Monomer surface treatment. 3- Acrybond (bonding agent) surface treatment** . Testing the bond strength for all specimens until failure was evaluated under transverse, tensile and shear loads ; the peak load was recorded and statistically analyzed. Mode of failure was evaluated visually under light microscope to determine the failure whether it was **adhesive ,cohesive or mixed**.

The high impact heat cure acrylic specimens which were fractured and repaired with cold cure acrylic showed significantly higher **transverse and shear bond strength** compared to the other types of heat cure acrylic .

Rapid simplified heat cure specimens were recorded the highest mean value compared with the other types in the tensile bond strength of denture base. All specimens with surface treatment **monomer** and **acrybond** showed higher bond strength mean value compared to **control group** in the 3types of heat cure acrylic specimens . The highest bond strength was recorded for specimens treated with acrybond compared with monomer group for **transverse and shear bond strength** , while monomer group showed higher tensile bond strength compared with acrybond group. The mode of failure was mostly adhesive in the untreated group and was mostly cohesive and mixed in the monomer and acrybond treated group.

Finally, it can be concluded that the type of denture base affect the value of bond strength of repaired specimens that processed with different thermal cycles and the surface treatment had an important parameter in improvement the strength of repaired acrylic denture base resin.