

Effect of Glass Fiber Reinforcement Surface Treatment on the Soft Liner Retention and Longevity

A Thesis Submitted to the Council of the College of Dentistry, University of Baghdad, in partial fulfillment of the Requirement for the Degree of Science of Master in Prosthodontics

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Abstract

Statement of the problem: The denture resilient liners have a commendable capacity to restore the health of the inflamed and distorted mucosa. Despite their advantages the liners possess a few disadvantages also. Among them the chief disadvantage is bond failure occurring between the liner and denture base which will create a potential interface for microleakage which subsequently results in delamination of the liner from the denture thus negating the effective function of liner.

Purpose: The purpose of this study was to evaluate the effect of glass fiber in the surface treatment to improve the adhesion between 2 types of silicon soft liners: Mollosil(cold cure silicon soft liner) and Molloplast-B(hot cure silicon soft liner) and 3 types of denture base materials(conventional heat cure acrylic, pour acrylic and light cure acrylic) and measure the shear bond strength between them.

Material and Method: A total of 300 specimens of the 3 types of the acrylic resins were prepared, for each acrylic type 100 specimens were prepared into 2 major groups (50 specimens for each type of the relined material) and each group divided into 5 subgroups each subgroup contain 10 samples: Subgroup 1: prepared with smooth surface without surface treatment (control group), Subgroup 2: prepared with smooth surface with glass fiber treatment, Subgroup 3: prepared with rough surface, Subgroup 4: prepared with rough with glass fiber treatment, Subgroup 5: prepared with glass fiber net surface treatment. The specimens collected and stored in distilled water at 37° for 24h after that tested with Instron testing machine with across head speed 5mm/min and in N/mm² unit.

Results:

1. There was increase in the bond strength between the conventional heat cure acrylic and the Mollosil with the rough , rough with glass fiber and glass fiber net surface treatment.

Abstract

2. There was increase in the bond strength between the pour acrylic and the Mollosil with all the types of the surface treatment.
3. There was increase in the bond strength between the light cure acrylic and the Mollosil with the rough surface treatment only.
4. There was no increase in the bond strength between the 3 types of the acrylic with the Molloplast-B with all types of the surface treatment.

Conclusion: Some types of surface treatment has an effect on the shear bond strength between the conventional heat cure acrylic ,pour acrylic and light cure acrylic with the cold cure silicon soft liner and have no effect between the 3 types of the acrylic with the heat cure silicon soft liner The increase or decrease in the bond strength either due to the increase or decrease in the mechanical, chemical or mechanochemical bond between the acrylic and the silicon soft liner.