Comparison of Bond Strength of Auto Polymerizing, Heat Cure Soft Denture Liners with Denture Base Resin - An In Vitro Study

Neerja Mahajan, Kusum Datta

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Optimum bond strength between denture soft liner and denture base resin is very important for the success of any denture prosthesis. The tensile bond strength of two commercially available silicone-based heat cured (Molloplast B) and auto polymerizing (Mollosil) was compared with denture base material (trevalon). Molloplast B-trevalon bond in both un-polymerized (dough stage) and already polymerized forms were also compared. Lloyds Universal testing machine was used to test 60 samples. Molloplast B bond strength was greater than Mollosil soft denture liner; it was even greater when packed against trevalon in an un-polymerized form than an already polymerized trevalon using primo adhesive. Both the soft lining materials used are acceptable for clinical usage.

Keywords: Auto polymerizing soft denture liner, Denture base resin, Heat cure soft denture liner, Tensile bond strength

Introduction

Soft denture liners are valuable assets for dentists. They act as shock absorbers; reduce and distribute stress on the denture bearing tissues because of their viscoelastic properties. Chronic soreness is a significant problem for denture patients with diabetes or other debilitating diseases and for many geriatric patients.

Soft denture lining material was first reported in 1943 (Tylman 1943; Popper 1945) [1]. Matthews (1945) [2, 3] introduced one of the first synthetic resins in the form of plasticized polyvinyl chloride.

Today, soft liners are divided into two main types:
   A. Plasticized acrylics
   B. Silicone elastomers

One of the very first tests conducted by Bates and Smith (1965) [4] assessed the bond strength of 12 soft liners using tensile test. Kawano et al. (1992) [5] further confirmed and concluded that the tensile test method was effective in ranking the bond strength of 6 soft denture liners to denture base.

Materials and Methods

Materials Used in this study were: (Figs. 1, 2 and 3)

A total of 60 samples were prepared and divided into two main groups.

**Group 1**: 20 samples of chair side liner Mollosil packed against denture base trevalon.

**Group 2**: 40 samples of heat polymerizing soft denture liner Molloplast-B packed against denture base trevalon.

**Group 2 (subgroup A)**: 20 samples of Molloplast-B packed against trevalon in an already polymerized form.

**Group 2 (subgroup B)**: 20 samples of Molloplast-B packed against trevalon in an un-polymerized (dough) form.
A special flask made of brass was fabricated with a removable 3 mm brass spacer (Fig. 4). The cross-sectional area of liner was $14 \times 10 \, \text{mm}^2$ and thickness was 3 mm (Fig. 5). A flask with three detachable parts with a sample mold cut out in the middle part was used. All the samples were made to the same dimensions.

**Group 1:** Two blocks of trevalon were prepared in a water bath by processing resin at 74°C for approximately 2 hours, then increasing the temperature to 100°C and further processing for 1 hour. The brass spacer was in its place while processing. After curing, the flask was bench cooled. The surfaces of the blocks to be bonded to liner were cleaned with fine grit sandpaper. Mollosil adhesive No. 03007 was

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