

Effect of Soft Liner Material on Retention of Complete Denture, (An In Vitro Study)

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Abstract: Objective: This study directed to evaluate the effect of three different soft liner materials (visco- gel Dentsupply, Germany), (Silicone soft reline material, Pentusil Bosworth company, EU), and (Molloplast-B) on the force of retention of the complete denture. **Materials and Methods:** This is an experimental parallel design. This study cover three types of materials tested on 90 patients for their effect on retention of complete denture by measuring the force of retention using force guage. The collected data were analyzed by Statistical Package for Social Sciences (SPSS, version 20). **Results:** Mean bond strength of the visco-elastic material was significantly ($P < .05$) higher than silicon liner and Molloplast for experimental use. Diversified form of disappointments were clearer in the group of Molloplast-B material, while it was less in the group of silicon liner material, and the least was in the group of visco-elastic lining material. **Conclusion:** The bond strength of the visco-elastic material was the best for complete dentures wearers.

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Keywords: Material; patient; retention; force guage; viscoelastic; mastication

1. Introduction:

Resilient coating tools are applied on dental prostheses to absorb the energy formed by masticator bearing (1). A soft lining would allocate the functional and parafunctional pressures more consistently and thus have reducing outcome due to their elastic actions, (2,3). Because of their capacity to return health to the distorted tissues, soft liners are applied for the management of persistently annoyed tissues, thin and non-resilient mucosal tissues (4,5).

The most common difficulties met with the soft liners is the lack adhesion among the denture base and the liner (6,9). This adhesive distress makes a situation for possible bacterial growth and faster interruption of the soft lining (8). The measurement is essential to minimize the effects of lack bond between the liners and dentures base (10).

Some researchers have recommended different methods to increase strength bond, e.g. mechanical toughening, treatment with denture base monomer (2, 5, 11). The effect of toughening of the denture base surface on the bond strength of soft liner is arguable (11), whereas Amin et al stated that toughening the acrylic resin base by sandblasting before put on a liner material had a weakening effect on the link (12).

Jacobsen described that laser management of denture base before liner use caused reduction of link strength (5). The uses of soft liner on the untreated surface reduce friction between the two surfaces (7). A positive association was noted between the tensile strength values and deformation rate of specimens (7). While information is existing about mechanical liners toughening of denture base, there is scarcity of

evidence concerning the chemical application, specifically with denture base. This study was directed to evaluate effect of different three soft liner materials (visco- gel Dentsupply, Germany), (Silicone soft reline material, Pentusil Bosworth company, EU), and (Molloplast-B) on the force of retention of the complete denture.

2. Material and Methods:

This is an experimental parallel design. It was conducted in Albaha, Saudi Arabia. Sample of ninety patients were used and divided into three groups, each of thirty patients. Each group was treated by complete denture with the different soft liner materials respectively. Three materials including resilient liners, visco- gel, Silicone soft reline material, and Molloplast-B Super-Soft were selected.

Force guage was utilized to record the retention of all denture bases. The device first accustomed and the unit of measurement was selected to be grams. The desired adapter tension hook was attached to sensing head. The sending end with the adapter were placed in line with the denture that being measured. The patient was in an upright position with the occlusal plane parallel to the floor and the denture base was inserted and allowed to remain for setting time of 4 minuits for the hook of the denture base was engaged.

This study was approved by the Dental Health Department at Faculty of Applied Medical Sciences, Albaha University. The consents forms were filled by all participants. The right of the participants to

withdraw any time was explained and preserved during the study.

(SPSS version 20). P values less than 0.05 were considered significant with level of confidence 95%.

The data were then analyzed by computerized methods; (Statistical Package for Social Sciences)

3. Results:

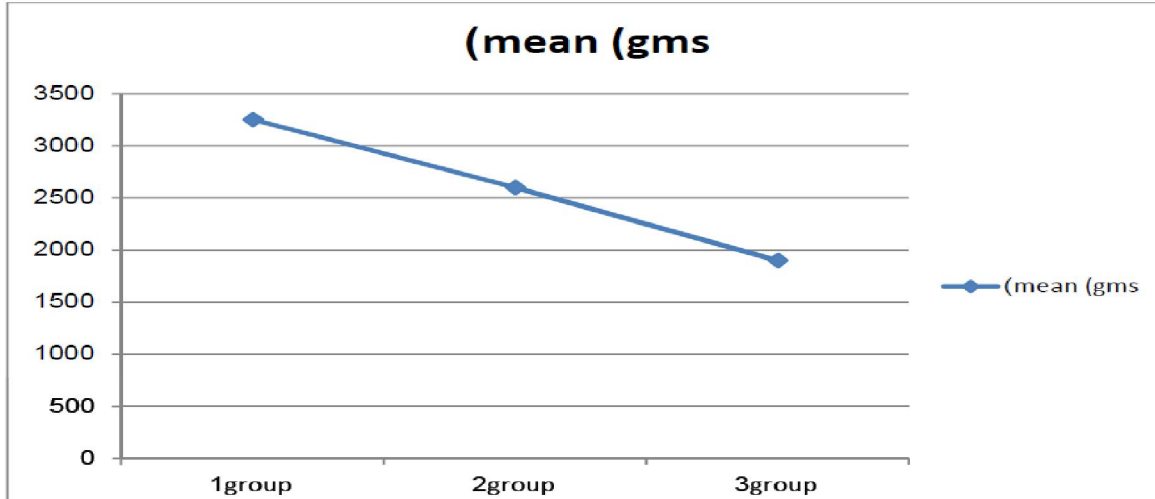


Figure (1): Displays means and standard deviations for the three soft liner materials

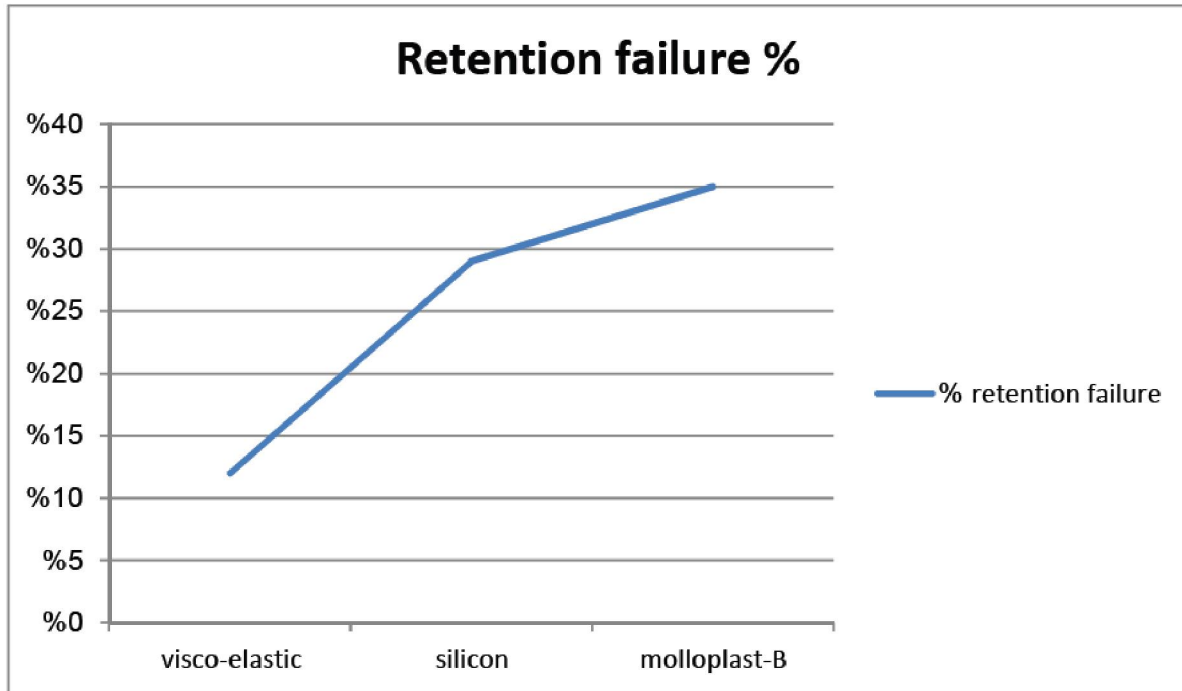


Figure (2): Displays the failure rates of retention between different types of lining materials.

Table 1: Means and standard deviations for the three soft liner materials.

Groups	Material	Mean(gm)	±SD	P* value
Group 1	Visco- gel	3250	±1300	<0.001*
Group 2	Silicon	2600	±1120	
Group 3	Molloplast-B	1900	±1090	

*p<0.05 significant

Table (2): The tensile strengths between various soft lining materials

Lining material	Source of variation	Sum of squares	df	Mean	F	P value
Visco-gel	Between groups	6400	2	3200	9100	<0.001*
Silicon		5100	2	2700	8050	
Molloplast-B		3700	2	1950	4600	

*p≤0.05 significant

4. Discussion:

Mean bond strength of the visco-elastic material was significantly ($P < .05$) higher than silicon liner and Molloplast, for clinical use. Varied form of loss were more clear in the group of Molloplast-B material, while it was less in the group of silicon liner material, and the least was in the group of visco-elastic lining material. The lack of union between a silicone based resilient lining and an acrylic denture base material is a common dental problem. (13, 14).

This study showed that the retention strength values of the dentures varied according to the different lining materials. The surface handling of denture base with monomer improves bond strength of both the liners. To attain a good attachment concerning denture liner materials and denture base resin, many experimental studies have been approved that including toughening of denture base resin, influence of polymerization stage on the acrylic resin and chemical superficial treatment of denture base resin (13, 15).

Super-Soft formulates a hard bond with acrylic resin, however, devoid of a bonding mediator as both have a similar structure (16). Molloplast-B, is a silicone based liner, needs an adhesive MMA, a solvent that liquefies the PMMA (17). Therefore, the use of both monomer and adhesive before putting resilient liner may effectively improve the dissolution of the PMMA. It allows additional fluid to enter between polymer chains and become tangled when the additional monomer or solvent is vaporized (18).

The strengths of this study include testing three methods for retention of complete dentures. The study limitations were; the study was conducted among only 90 patients in Al-baha region; such studies will yield more useful results if conducted on more sample size with randomization all over the country.

Competing on interest:

I declare that this study is one of my own works. It was not submitted to any other journal. I also declare that I have no competing interests related to this study.

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