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Soft Liners- A brief review

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Abstract
A soft liner is an elastomeric polymer used in the prevention of chronic soreness from denture and also helps in the preservation of supporting structures. They are made resilient by addition of alcohol type plasticizers or by co-polymerization with the monomer unit. The indications for use of a resilient liner are existence of thin, non-resilient mucosal coverage of the residual ridge, poor ridge morphology, persistent denture-sore mouth, and acquired or congenital oral defects.

Keywords: soft liner, tissue conditioners, relining, soreness.

1. Introduction
Relining is a process of resurfacing of a denture with new base materials to make it fit more accurately. While rebasing is a process of replacing the entire denture base material with new material. Relining is indicated when there is resorption of the ridge and denture lack retention and stability. It is for refitting of the impression surface. Rebasing is indicated when there is discoloration of denture base or porosity of denture base. Reline is defined as the procedure used to resurface the tissue side of a denture with new base material, thus producing an accurate adaptation to the denture foundation (GPT-8).

2. Literature Review
Stoner (1962) stated that the rational for using a soft lining material is that a part of the energy transferred from it to the denture aids in deforming the denture elastically and consequently reduces the direct load of mastication on the atrophied area. In addition, the soft lining procedures as equal amount of pressure over the bone of the ridge and thereby avoid resistance from the prominent spicules to a larger amount of applied force. Ortman and Ortman (1975) have described the ideal properties of a resilient liner and recommended that these liners serve merely as aids in solving the problems and not as the total solution.
Wright (1976) investigated fifteen resilient liner materials and analyzed them for water absorption, water solubility, viscoelastic properties, and the effect of bonding these materials to polymethyl methacrylate. He notes that silicone rubbers are well established resilient lining materials. They have 10% to 35% inorganic silicates that determine their water absorption characteristics. The results of his study indicate that Molloplast-B has a lasting softness and an especially low water absorption rate similar to that of the acrylic of the denture base. [1]
Suchatlampong et al. (1976) have determined that silicone rubber materials are most satisfactory with regard to compressibility. They produce a stress-relieving action that is adequate if they are at least 2 mm thick. The study indicates that a 2 to 3mm thick section of Molloplast-B has superior compressibility.

3. Types of Soft Reliners
i) Heat cured Lining Denture Bases
A silicone rubber liner can be added to a previously processed denture base as a reline procedure or, more conveniently, can be included in the process of initial fabrication of the denture base.

ii) Initial Processing Procedure
1. Flask denture in a Hanau flask in conventional manner.
2. Boil out and apply tinfoil substitute to all gypsum surfaces of both halves of flask, and allow them to dry thoroughly (approximately 5 minutes).

3. To control the thickness of the Molloplast-B liner, a silicone putty spacer is constructed on the master cast in the lower half of the flask. Mix putty following manufacturer's directions and mold onto master cast maintaining at least a 3 mm thickness. When set, trim borders with scissors. Reduce excess thickness with a coarse stone mounted in a high-speed lathe.
4. Trial pack high-impact denture base resin in flask with silicone putty spacer.
5. Place flask in cold water in a Hanau curing unit, and set curing cycle and temperatures according to manufacturer's recommendations.
6. Bench cool and open flask. Halves of the flask will separate easily, as soft spacer does not engage undercuts in master cast.
7. Remove spacer and flatten resin borders with a carbide bur to provide a butt joint.
8. Reapply tinfoil substitute to gypsum surfaces of master cast and lower half of flask. Coat all exposed surfaces of resin with bonding agent. Trial packs, process, and finish Molloplast-B liner.

iii) Self-Administered Relining Materials

Several types of lining materials are available which enable the patient to attempt to improve the fit of ill-fitting dentures or to provide a soft cushioning effect to the fitting surface. Such products are generally available for purchase at many retail outlets such as supermarkets or chemists shops. The products normally contain methacrylate or vinyl polymers such as polymethyl-, polyethyl-, or polybutylmethacrylate or vinyl acetate along with a plasticizer such as butyl phthalate and a solvent such as acetone, ethanol or toluene. The claim for such products is that they improve the fit or comfort of a denture without having to visit the dentist. Most authorities agree however that the use of these products should be firmly discouraged, for all but short term emergency use. Long term use of these products can lead to harmful effects on the hard and soft oral tissues. Cases of irritation, severe bone loss and tumors, related to the use of self-administered denture lining materials, have been documented.

iv) Temporary Soft Liners or Tissue Conditioners

Tissue conditioners or temporary soft liners are materials whose useful function is very short, generally a matter of a few days. Currently for practical purposes, denture base materials are made of rigid materials. The dentist must recognize that the prolonged contact of these bases with the underlying tissues is bound to elicit changes of the tissues. Mucosal health may be promoted by hygienic and therapeutic measures and tissue-conditioning techniques may be applied when appropriate. Tissue conditioners are indicated to condition the abused tissue, whereas soft liners are indicated to give a cushioning effect to relieve and protect vulnerable tissues. A gel is formed when these materials are mixed, with the ethyl alcohol having a greater affinity for the polymer. [2]

Uses of Tissue Conditioners

Adjuncts for Tissue Healing: The merit of using a tissue conditioner is that they prepare the selected oral structures to withstand all the stress from the prosthesis. Tissue conditioners are generally used to preserve the residual ridge. They are also used to heal irritated hyperemic tissues prior to denture fabrication.

Temporary Obturator: Tissue conditioners may be added as a temporary obturator over the existing complete or partial denture; this may be done directly in the mouth or indirectly after an impression of the surgical areas has been made.

Stabilization of Baseplates and Surgical Splints or Stents: When undercuts are present on an edentulous cast, an acrylic temporary denture base cannot be used as it may get locked into the undercut and break the cast during removal. In these cases tissue conditioners of a stiffer consistency may be used to stabilize the record bases and prevent breakage of the cast.

Adjunct to an Impression or as a Final Impression Material: These materials are used when it is difficult to determine the extent of the denture base due to the presence of movable oral structures. These materials record the extensions of the denture in a dynamic form that will later help in preparing an impression tray for the final impression.

Adjunct to Determine the Potential Benefits of a Treatment Modality: Sometimes patients with well-constructed dentures develop chronic soreness and find it difficult to wear the dentures comfortably. Tissue conditioners can be used to determine if this problem can be resolved with the use of a resilient liner.

Procedure For Applying Tissue Conditioners

The following steps should be considered while applying a tissue conditioner on a denture. Preparation of the dentures: The tissue part of the denture base, which crosses an undercut, should be reduced. The tissue surface of the denture, which covers the crest of the ridge, should be reduced by 1 mm. It should be remembered that the dentures should allow sufficient room for the placement of the tissue conditioner in order to promote the recovery of displaced and traumatized tissues. The mixing ratio can be changed according to the consistency required. A ratio of 1.25 parts of polymer, 1 part monomer and d0.5cc plasticizer is usually recommended. The plasticizer should be added to the monomer. The ingredients are mixed to form a gel, which is applied in sufficient thickness to the tissue surface of the denture. The denture is inserted and border movements are carried out to mould the setting material. This method is similar to functional relining. 3

Care and Maintenance

Tissue conditioners should not be cleaned by scrubbing with a hard brush in order to prevent tearing of the material. The use of soft brush under running water is recommended. The greatest virtue of tissue conditioners is their versatility and ease of use. Their biggest flaw is that they are so easily misused. Their longevity against wear is very limited and they tend to harden and roughen within 4 to 8 weeks due to the loss of plasticizer. Hence, they require close observation. 4

Discussion

Materials available for use as resilient liners are natural rubber, soft acrylic materials, vinyl and silicone rubbers. Natural rubber has only a limited service period because of deterioration, fouling, and poor dimensional stability. Plasticized resin materials are the largest group of resilient liners; they are either cold-cure or heat-cure systems, or frequently they depend on the addition of plasticizer for their

resilience. A plasticizer eventually leaches out, leaving the material hard and often fissured, thereby promoting staining. Vinyl has short-comings similar to those of resins because they may harden in service gradually. Lower resistance to abrasion also is a problem and may contribute to the poor fit of dentures.5

Silicone rubbers probably are closest to being the ideal material. Achieving satisfactory bond strength between the silicone lining and denture base resin for a reasonable service life has been a problem. Use of newer bonding agents seems to have increased the service life. Although silicone rubber is a suitable medium for the growth of fungus, proper denture hygiene minimizes this problem.6

Conclusion

The greatest virtue of tissue conditioners lies in their versatility and ease of use. Their biggest flow is that they are so easily misused. Because the conditioner-lined dentures provide immediate relief and comfort, there is a danger that the patient will wear them too long and so cause trauma to the supporting tissue – thereby producing the very situation that their use is intended to prevent or correct. Their longevity in wear is very limited. They harden and roughen within four to eight weeks because of loss of the plasticizer. This requires close observation of the patient by the dentist. Since 1942, dentistry has sought to find a resilient denture lining material that would exhibit ideal clinical and laboratory qualities. To date, silicone materials have been considered the material of choice. 7

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