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### RESEARCH ARTICLE

#### LIQUID SUPPORTED DENTURE- A CASE REPORT ON MANAGEMENT OF FLABBY TISSUES

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#### Abstract

The ideal properties of a denture are adequate rigidity of polished surface to bear masticatory forces and flexibility and softness for better stress distribution. Conventional complete denture lacks retention and stability in cases with flabby tissue. A liquid supported denture can be a solution for this problem. This article describes the design of a denture in which the characteristics of plasticity and elastic recovery can be combined using a liquid supported denture; in a patient with completely edentulous maxillary arch with flabby tissue in anterior region. It allows uniform stress distribution due to its flexible tissue surface and improves the patient's acceptance.

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#### Introduction:-

Fibrous' or 'flabby' ridge is a superficial area of mobile soft tissue affecting the maxillary or mandibular alveolar ridges. It can be developed when hyperplastic soft tissue replaces the alveolar bone and is a common finding, particularly in long term denture wearers<sup>1</sup>. Such ridges are reported to be caused due to trauma from denture bases<sup>2</sup>. Major problems encountered in these patients are loss of stability and inadequate retention of the dentures. These problems occur because of the easily distorted flabby tissue during impression making. Several treatment modalities offered in such patients include surgical excision of flabby mass, implant-supported dentures or conventional prosthesis without surgery<sup>1</sup>. Selection of a particular therapy depends on systemic health and need of the patient, extent of flabby mass, financial burden on patient and skill of the prosthodontist. In many cases, surgical procedure is not worthwhile, hence the most conservative methods is approached. One such conservative method is the fabrication of liquid supported complete denture. This clinical report describes the fabrication of a liquid-supported maxillary complete denture in a patient with completely edentulous maxillary arch with flabby tissue in anterior region opposing a completely edentulous mandibular arch.

#### Case Report

A 70 year old male patient reported to the Department of Prosthodontics, with the chief complaint of difficulty in chewing food due to ill- fitting dentures. Patient gave a history of

Edentulousness for the past 7 years and had a single set of dentures that were ill fitting. Intraoral examination revealed completely edentulous maxillary and mandibular arches. Maxillary anterior region revealed flabby tissue on palpation. The general condition of the patient was debilitated and frail. Keeping the various challenges associated with the case, clinical steps and treatment plan was modified to suit the patient's need. The treatment plan included the fabrication of a liquid-supported maxillary complete denture opposing a mandibular complete denture for even distribution of load.

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Primary impressions were made using irreversible hydrocolloid. Special trays were fabricated and border molding performed using low fusing impression compound. The definitive impressions were made with Zinc Oxide Eugenol impression paste. Face bow transfer was done to a semi-adjustable articulator. Jaw relation was recorded and try-in was carried out. Vacuum heat-pressed polyethylene sheet (0.5 mm thick) was adapted on the cast; and cut 2 mm short of sulcus and posterior palatal seal (Fig 1) with the help of a vacuum heat-pressed machine. This sheet was adapted over the master cast. It was incorporated during the packing stage of denture processing. 0.5 mm putty spacer created (Fig 2) and placed over the adapted vacuform sheet during denture packing. Denture with the sheet was finished, polished and inserted into patient's mouth to check retention, stability, support, esthetics and occlusion. The patient was asked to use the denture for two weeks till he got adjusted to the new dentures. The maxillary denture was now ready to be converted into a liquid-supported denture. Vacuform sheet teased off and putty spacer removed after the denture acrylization. Vacuform sheet glued back to the denture (Fig 3). The adhesive used is n-butyle-2 cyanoacrylate (Fig 4), which is used in surgery as an alternative to suturing and as a protective covering over ulcers etc. This difference in space was occupied by liquid in the final prosthesis. Permanent polyethylene sheet was incorporated in the denture base with the aid of cyanoacrylate adhesive. Inlet was made in the denture; palatally in molar region. Glycerine (Fig 5 & 6) was filled through the inlet and then sealed with self-cure acrylic resin. Final denture was evaluated for retention, stability, support, esthetics, phonetics, vertical dimension and occlusion. Mandibular denture was acrylised in the conventional manner (Fig 7, 8, 9 & 10). In this case, polyethylene thermoplastic clear sheet was used because of its softness, flexibility and biocompatibility. Glycerine was used because it is colourless, odourless, viscous and biocompatible.



**Fig 1:-** Vacuform sheet adapted on the master cast.



**Fig 2:-** Putty spacer (0.5 mm) created and placed over the adapted vacuform sheet during denture packing



**Fig 3:-** Vacuform sheet glued back to the denture



**Fig 4:** Cynoacrylate adhesive to adhere the vacuform sheet back to the denture



**Fig 5:-** Glycerine used as the liquid medium .



**Fig 6:-** Injection of glycerine into space created.



**Fig 7:-** Finished and polished denture.



**Fig 8:** Post-op intra-oral right lateral view



**Fig 9:-** Post-op intra-oral left lateral view.



**Fig 10:-** Post-op intra-oral frontal view.

### **Discussion:-**

The main concern in this case was the presence of flabby tissue in anterior maxilla that might have caused an unfavourable distribution of masticatory forces. This problem was solved by modifying the impression technique and by fabricating maxillary liquid-supported denture. . Liquid-supported denture is based on the concept that when the force applied on the denture is absent, the base assumes its pre-shaped form. But under masticatory load, the base adapts to the modified form of mucosa due to hydrodynamics of the liquid improving support, retention and stability<sup>3</sup>.

There will also be optimal stress distribution of masticatory forces over a larger area which reduces tissue overloading. Advantages of liquid supported denture<sup>4</sup> are:

1. Preservation of residual ridge by optimal distribution of forces.
2. Better retention, stability, support and comfort due to close adaptation.
3. Optimized atmospheric pressure, adhesion, cohesion and mechanical
4. interlocking in undercuts.
5. Improved patient tolerance because of great comfort due to smooth flexible surfaces.
6. Prevention of chronic soreness from rigid denture bases.

For this case polyethylene sheet was used due to its compatibility and excellent physical and mechanical properties. It is soft, flexible and dense and protects the mucosa from bacterial and biomechanical irritation. The adhesive used is n-butyl-2-cyanoacrylate which is used in surgery as an alternative to suturing and as a protective covering over ulcers. Glycerine is used as the liquid cushion as it is clear, colorless, odorless with good pharmaceutical properties. It has good thermal stability, water repellence, and low surface tension, low vapour pressure. It also acts as a vehicle and solvent, a sweetening agent, a preservative in some liquid medications so it has proven in vivo safety<sup>5</sup>. The concept of liquid-supported denture is indicated in severely resorbed maxillary and mandibular ridges, inflamed or

flabby tissues, vesiculobullous lesions like pemphigus, pemphigoid, erythema multiforme, oral lichen planus, and patient with systemic disorders like diabetes mellitus<sup>2</sup>.

Denture care instructions were given to the patient. Patient was told to clean the tissue surface using soft cloth or cotton. Patient was recalled after 24 h, 1 week, and 3 weeks for follow up.

The problem faced in fabrication of complete denture was difficulty in achieving complete seal at the junction of polyethylene sheet and denture base. The main drawback is relining is not possible in fluid retained dentures.

### **Conclusion:-**

Flabby ridges, often, due to their increased resiliency and compressibility causes difficulty in retention and stability of the denture bases and poses a real challenge to a prosthodontist for achieving the basic objectives of impression making. Surgical intervention and implant-supported dentures may not be possible to be applied in all those clinical conditions. Liquid supported denture can stand a better option in such situations while considering conventional prosthodontics. This concept can further improve the patient's comfort and acceptance due to more uniform distribution of occlusal forces.

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