GEL SUPPORTED DENTURE
Ravi S Patel, Vikas Karambelkar, Jaynti R Patel, Rajesh Sheturaman, Sarfarz Memon
Department of prosthodontist, K.M. Shah Dental College and Hospital, Vadodara, Guajarat-391760, India, Corresponding author: Dr. Ravi S Patel, Department of prosthodontist, K.M. Shah Dental College and Hospital, Vadodara, Guajarat-391760, India E-mail I.D: ravisurat@gmail.com

ABSTRACT
The ideal properties of a complete denture are adequate rigidity on the polished surface to bear masticatory forces and at the same time, flexibility and softness on the tissue surface for proper and even distribution of the masticatory forces. The problem with a conventional denture is that on its tissue surface, the denture is rigid leading to uneven distribution of load. Various methods and materials have been used to give a cushioning effect to the tissues when dentures are actually in use including liquid-supported dentures. The complete denture is designed so that the base is covered with a preshaped, closed fitting, flexible, foil. This technique allows continued adaptation of the denture to the mucosa in the resting and functional states. A complete denture will not have a good prognosis if it violates the foundation on which it rests. gel-supported dentures eliminate the main disadvantages encountered due to rigid denture base materials thereby providing proper retention, stability, support and comfort to the patient.

KEY WORDS: Liquid supported denture, flabby ridges

INTRODUCTION
Dimensions of the edentulous residual ridge are not stable because of bone resorption and mucosal changes from muscle dynamics or tissue irritation. An ideal denture base would continuously adapt to the mucosa and thus should be flexible. However, it also has to support the teeth during function and thus should be rigid. Obviously, these properties cannot be combined in one material. Yet, with combinations of materials, the base can be rigid where it needs to be strong and flexible where in contact with the soft tissues. In 1961, Chase reported on the application of elastic impression materials on the mucosal side of the rigid to relieve the traumatized soft tissue. Since then a variety of tissue-conditioning materials has been introduced. This article describes the design of a denture in which the characteristics of plasticity and elastic recovery can be combined.

CASE REPORT
A 70 years old female patient named Mrs. Menaben Patel reported to K.M.S.D.C.H, Vadodara for replacement of missing teeth. The patient had a history of wearing complete dentures for 5 years. Her chief complaint was the poor fit of the denture and she felt loose while eating. By intraoral examination, a completely edentulous maxillary and mandibular arch with severe resorption in lower arch (Fig. 1). Keeping the various challenges associated with the case, clinical steps and treatment plan was modified to suit the patient’s need. It was decided to give a mandibular complete denture (gel supported) opposing maxillary conventional denture. Primary impressions were made with alginate (Zelgan, Dentsply/caulk). Border molding was performed by using low fusing impression compound (Aslate, India) and final impression made with Zinc Oxide Eugenol paste. Jaw relation and Teeth were set and the try in procedure of the waxed denture was done. The lower denture design was modified to make a liquid supported denture. Lower master cast was duplicated using alginate. Steps in fabricating a liquid supported denture:-
Vacuum heat pressed polyethylene sheet of 1 mm thickness was adapted on the master cast. The sheet was made 2 mm short of the sulcus.(fig 2) Uniform thickness of putty placed on the master cast 1 mm short of vacuumed formed sheet to create space for tissue conditioner(fig 3). This sheet was incorporated in the denture at the time of packing. Upper complete Denture processed in conventional manner.
1. After processing of lower denture was done vacuumed formed sheet and putty was removed. The 1 mm thick sheet was removed from the denture (Fig. 4). Due to removal of the sheet crevices were formed all along the denture borders. These crevices were helpful in final placement sheet.
2. Cutted vacuumed formed sheet fixed in the internal surface of lower denture with Cyanoacrylate adhesive and autopolymerising acrylic resin were used to seal the borders and prevent escape of liquid. so tissue surface area preserved by sheet.

3. Then two holes are made on the buccal flange area of lower denture one for injection of tissue conditioner and other for removal of excess material. Denture was placed on the master cast and secure with rubber band.

4. Tissue conditioner mixed antifungal agent also incorporated on it. Then tissue conditioner loaded into 5 ml syringe and injected from the one hole till the excess comes from another hole. Schematic representation of the cross sectional view of the denture shown in fig 5.

5. Upper and lower denture was inserted (fig 6) and vertical dimension was verified simultaneously. The holes were sealed using self cure acrylic resin. Finally the upper liquid supported denture was delivered. Denture care instructions were given to the patient. Patient was informed to clean the tissue surface using soft cloth. Recall appointments were scheduled at 1 day, 1 week, 1 month and 3 months. At 1 months recall appointment, patient was comfortably using the denture. The denture was well maintained.

Fig 1: Intra oral view of maxillary and mandibular arch
Fig 2: 1 mm thick sheet placed on the master cast

Fig 3: Putty is placed to create space

Fig 4: Processed complete dentures

Fig 5: Schematic representation of the cross sectional view of the denture with polyethylene sheet and liquid
DISCUSSION

Major problems associated with this case were the resorbed ridges are excessive. These problems were solved by reducing amount of masticatory force by modifying the impression procedures and by fabricating gel supported denture. Gel supported denture is based on the theory that when the force applied on the denture is absent, the base assumes its preformed form that is the one during processing. But under masticatory load, the base adapts to the modified form of mucosa due to hydrodynamics of the liquid improving support, retention and stability. There will also be optimal stress distribution of masticatory forces over a larger area which reduces tissue overloading. Prevention of soreness and increased comfort level are other advantages of the liquid supported denture. In this case, polyethylene thermoplastic clear sheet (Biostar Vacuum forming machine, Scheu-dental, Germany) was used because of its softness, flexibility and biocompatibility. Tissue conditioner was used because it is clear, viscous, and biocompatible.

CONCLUSION

Resorbed ridges pose a prosthodontic challenge for the achievement of stable and retentive dental protheses. To minimize further resorption conventional procedure will not work properly. The use of gel supported denture can further improve the patient’s acceptance due to more uniform distribution of forces and due to the improved comfort level.

REFERENCES


