

Liquid-supported Denture for Flabby Ridge: An Innovative Approach

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ABSTRACT

Flabby ridges pose significant problems in achieving retention and stability of a complete denture due to movable underlying tissue. Liquid-supported denture technique allows continued adaptation of denture to the mucosa both at resting and functional state. It allows better stress distribution due to its flexible nature and provides an alternative treatment approach in flabby ridges. This paper describes the technique for the fabrication of maxillary liquid-supported complete denture opposing completely edentulous mandibular arch.

Keywords: Flabby ridges; flexible; liquid-supported denture; thermoplastic sheet.

INTRODUCTION

Flabby ridge is mobile tissue affecting the residual alveolar ridges.¹ It is most commonly seen in maxillary anterior region.^{2,3} As flabby tissues are easily distorted during impression making, dentures fabricated on such foundations are often compromised in retention and stability.⁴

The denture in such cases should be flexible and properly adapt to mucosa.⁵ Several materials like elastomeric impression material,⁶ tissue conditioners and soft liners⁷ have been used in past to achieve flexibility and incorporating liquid within denture also provides better solution.⁸⁻¹⁰

This paper describes the fabrication of liquid-supported maxillary denture in a patient with flabby tissue in anterior region.

CASE REPORT

A 60-year-old female patient reported the Department of Prosthodontics and Crown and Bridge, BPKIHS, Dharan for the prosthodontic rehabilitation of the edentulous maxilla and

mandible. The patient had a history of wearing complete dentures for five years which were loose and ill-fitting. She was also using denture adhesive. Her intraoral examination revealed completely edentulous maxillary arch with flabby tissue in the anterior region (Figure 1) and severely resorbed mandibular ridge.

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 fabricate



Figure 1: Maxillary arch with flabby area in anterior region.

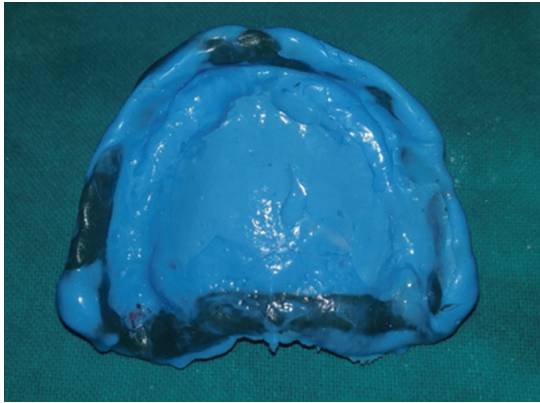


Figure 2: Final impression.



Figure 3: Teeth arrangement.

a liquid-supported maxillary complete denture opposing a conventional mandibular denture.

Procedures

The primary impressions of both arches were made with irreversible hydrocolloid (Zelgan, Dentsply). Double spacer was applied in the maxillary anterior region and custom tray was fabricated. Border moulding was performed using low fusing impression compound (DPI Pinnacle tracing sticks, Dental products of India), and final impression was made with medium body silicone impression material (Reposil, Dentsply, Figure 2). Jaw relation was done, teeth were arranged and the try-in procedure of the waxed dentures was carried out (Figure 3).

The maxillary denture design was modified to make a Liquid-supported denture. Mandibular complete denture was acrylised using conventional procedure.

Steps in fabricating a liquid-supported denture

- A 1.5 mm thick polyethylene sheet (Biostat vacuum forming machine, Scheu-dental, Germany) was vacuum heat pressed on the maxillary master cast. The sheet was made 2 mm short of the sulcus and was not extended in posterior palatal seal area.
- Now, the denture was acrylised using heat cure resin with the sheet.
- After finishing and polishing, both the dentures were delivered to patient after making necessary occlusal adjustments (Figure 4). The patient was asked to wear the denture for two weeks to get adjusted to it.
- After two weeks, the patient was recalled to convert maxillary denture into liquid-supported denture. The 1.5 mm polyethylene sheet was removed from the maxillary denture (Figure 5).



Figure 4: Impression surface of finished denture.

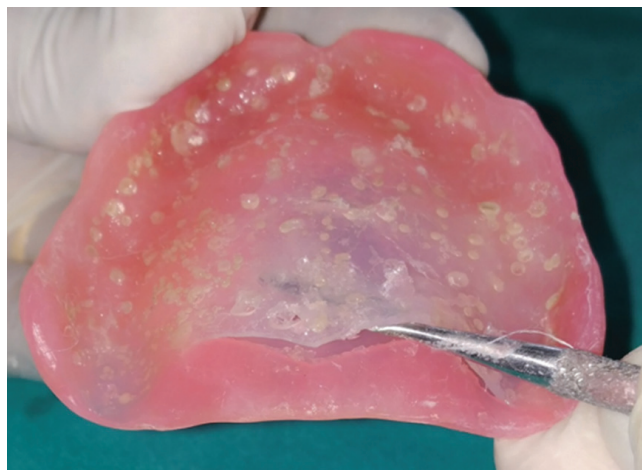


Figure 5: The 1.5 mm polyethylene sheet was removed.



Figure 6: The 0.5 mm polyethylene sheet sealed with adhesive and acrylic.

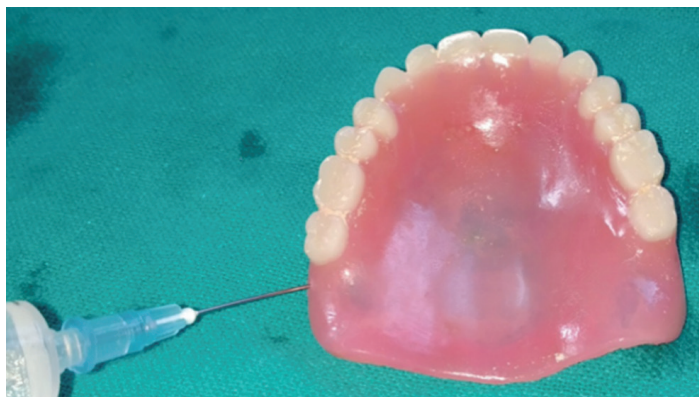


Figure 7: Glycerine was injected inside 1 mm of created space.



Figure 8: Final denture.



Figure 9: Final denture insertion

- The borders of the 0.5 mm thick sheet were placed in the crevice formed due to removal of 1.5 mm thick sheet. Cyanoacrylate adhesive and autopolymerizing acrylic resin were used to seal the borders and prevent escape of liquid (Figure 6).
- The 1 mm hollow space created was filled with glycerine (Glycerin IP, Amar products, India). Two holes of about 2 mm diameter were made in disto-buccal region of denture and glycerine was injected using needle and syringe (Figure 7). Holes were sealed off using self-cure acrylic resin.
- An additional silicone putty impression was made of the tissue surface of the denture, and the cast was made of it.
- On this cast, 0.5 mm polyethylene sheet was vacuum heat pressed which was used in place of 1.5 mm thick sheet creating a 1 mm space between tissue surface of the denture and final polyethylene sheet.
- Finally, the maxillary Liquid-supported denture was delivered (Figure 8, 9). Denture care instructions were given to the patient and recalled for follow-up.

DISCUSSION

The main problem of this case was the presence of flabby tissue in anterior maxilla that might have caused an unfavourable distribution of masticatory forces.^{1,4} This problem was solved by modifying the impression procedure and by fabricating a liquid-supported denture. Liquid-supported denture is based on the theory that in the absence of external forces, it assumes pre-shaped form of undistorted supporting tissue. But under masticatory load, hydrodynamics of liquid in the closed cavity distributes the load evenly over entire flabby area, while maintaining intimate contact with the flabby tissue. Liquid-supported denture is flexible and continuously adapts itself to the mucosa. The prime benefits of this denture are prevention of soreness, increase comfort level and improve support, retention and stability of the denture.⁸⁻⁹

In this clinical report, polyethylene thermoplastic clear sheet was used because of its softness, flexibility and biocompatibility. For a liquid cushion, glycerine was used, which is clear, colourless, and odourless with a good pharmaceutical action. To prevent the liquid from leakage, a dense foil must be used. This design will act as a continuous reliner for the denture and thus has an advantage over the existing denture designs.⁸⁻¹⁰

SUMMARY

Flabby ridges pose a prosthodontic challenge for the achievement of stable and retentive dental prostheses. Liquid-supported denture with its combined rigid and flexible property, improves stability and retention of the denture. It reduces trauma to the flabby tissue and is comfortable to patients.

Conflict of Interest: None.

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