



Case Report

Prosthodontic Management of Flabby Ridge - From Modified Impression to Denture

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ABSTRACT

‘Fibrous’ or ‘flabby’ alveolar ridges pose significant problems which arise during the act of impression making and less retention and stability of a complete denture due to movable underlying tissue. This paper describes the modified impression technique for the fabrication of maxillary liquid supported complete denture opposing partially edentulous mandibular arch.

Introduction

‘Fibrous’ or ‘flabby’ ridge is an area of superficial area of mobile soft tissue affecting the maxillary or mandibular alveolar ridges. It can develop when hyperplastic soft tissue replaces the bone and is particularly present in maxillary anterior region especially in long term denture wearers.¹ The trauma is inevitable when anterior maxilla occlude with the lower teeth anterior to the basal support.² Histologically, flabby ridges are composed of hyperplastic mucosal tissue and loosely arranged fibrous connective tissue and dense collagenised connective tissue. In the soft tissue, a great amount of metaplastic

cartilage and/or bone are observable.³ The flabby ridge management which are documented are:

1. Surgical removal of fibrous tissue
2. Implant retained prosthesis -Fixed, Removable
3. Conventional prosthodontics without surgical intervention.

The treatment should be chosen according to patient’s health and need, flabby tissue extent, financial capacity and dentist skill. In certain situations, surgical intervention or implants is not possible and conservative management is the treatment of choice.¹



Various techniques to relieve flabby tissue have been used on the tissue surface of the denture. In 1961, Chase introduced the use of elastic impression material to relieve traumatized tissue. But this can be only a temporary provision.. The various types of tissue conditioning materials have been used. Soft liners have also been used to relieve these problems.^{4,5} The soft tissue changes and bone resorption occurs because of muscle dynamics or tissue irritation, which ultimately affects the residual ridge dimensions⁵. Thus, the close adaptation to the adjacent mucosa of denture seldom remains. An ideal denture base in flabby ridge cases should be flexible, as it has to continuously adapt to the mucosa and reduce stress and trauma to underlying tissue. However, it also has to be rigid so as to support the teeth during function. These properties can be combined by using combination of materials.⁶ Liquid-supported denture can hence be a solution for this problem.

This paper describes the fabrication of maxillary complete denture opposing partially edentulous mandibular arch with a modified impression technique and a design of a liquid supported denture.

Case report

A 77 year-old male patient reported to the department of Prosthodontics and Crown & Bridge, Subharti Dental College, dental college, for remake of his old denture . The patient had history of wearing the maxillary complete denture opposing mandibular partial denture since last 6 years. His chief complaint was the poor fit of the denture, and it felt loose while eating. On intraoral examination, a completely edentulous maxillary arch with flabby tissue existing in the anterior region was observed (Figure 1). It was decided to give a Liquid-supported maxillary complete denture because of flabby soft tissues in anterior

maxillary region and removable partial denture in mandibular arch.

Impression technique

Primary impressions were made with irreversible hydrocolloid (Plastalgine Alginate, Septodont, USA). Impression was poured in type III plaster (Kalabhai, Mumbai) to get the primary cast. Wax Spacer is adapted on the anterior maxillary region on primary cast. (Figure 2). A small anterior tray with guidance rod was made for the anterior flabby region using self-cured acrylic resin (Pyrex Self cure). The guidance rod was is proclined to allow the second full palatal tray impression to be guided in an oblique upward and backward direction to envelope the earlier small anterior tray. (Figure 3). Separating medium was applied over the small anterior tray and second tray was fabricated with guidance rod taken as guidance.(Figure 4) Spacer was removed and flabby ridge impression was made in small anterior tray using light body polyvinyl siloxane addition silicone material (3m ESPE) (Figure 5,6). Second over impression was made in second special tray using medium consistency polyvinyl siloxane impression material (3m ESPE) (Figure 7). The anterior tray with the guidance rod which also act as stop accurately locates the second full palatal tray. Thus, it allows a pre-planned even thickness of impression material. This final impression was poured in dental stone type III (Kalabhai, USA) to obtain the master cast.

Steps for fabricating liquid supported denture

(1) Denture base was fabricated on the master cast. The maxillary denture base should be 3 mm thick. Jaw relations were recorded and trial denture were waxed up in conventional method. A 1.5 mm thickness of Vacuum heat-pressed polyethylene sheet (Biostar vacuum forming machine, Scheu-

dental, Germany) was adapted on the maxillary master cast. It should be 2mm short of the sulcus. After dewaxing, 1.5mm vacuum heat pressed polyethylene sheet was adapted on the maxillary cast, and Vaseline was applied over it so that it can be retrieved easily (Figure 8). Now, the denture was acrylicised using this sheet. The maxillary denture was finished and polished.

(2) The maxillary denture was inserted in to the patient's mouth to check for retention, support, stability, and border extension. The patient was asked to wear the denture for two weeks to get adjusted to it.

(3) The patient was recalled after 2 weeks to convert the maxillary denture into a liquid-supported denture. The Polyethylene was removed from the maxillary denture. (Figure 9).

(4) The tissue side impression of maxillary denture was made with putty consistency addition silicone (Figure 10), and the cast was made with type III dental stone (Kalabhai, MUMbai) (Figure 11). A 0.5 mm thick vacuum heat pressed polyethylene sheet 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 (Figure 12).

(5) The crevice formed due to removal of 1.5mm thick sheet was used as guide to place 0.5mm thick polyethylene sheet. The borders were sealed with cyanoacrylate adhesive to prevent escape of liquid.

(6) The Glycerin was filled in the space created by the replacement of 1.5mm sheet with 0.5 mm sheet through the two holes drilled on the buccal flange in the molar area of the denture and glycerin was injected through the holes, and it was sealed with autopolymerizing self cure acrylic resin (Figure- 13,14).

(7) The maxillary Liquid-supported denture was delivered (Figure 15,16,17). Denture care instructions were given to the

patient. The patient was told to clean the tissue surface using cotton. The patient was recalled for follow up. The patient was satisfied with denture (Figure-18,19)

Discussion

The main problem with flabby tissue occur due to unfavorable tissue changes. These problems can be solved by modifying the impression procedure and by fabricating a liquid supported denture. The theory behind the liquid supported denture is that when the force applied on the denture is absent, the base assumes its preshaped 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.⁹ Thus, liquid – supported denture provides benefit of both tissue conditioners and soft liners.¹⁰

There are following advantage of liquid supported denture.¹¹

- Preservation of residual ridge by optimal distribution of forces.
- Better retention, stability, support and comfort due to close adaptation.
- Optimized atmospheric pressure, adhesion, cohesion and mechanical interlocking in undercuts.
- Improved patient tolerance because of great comfort due to smooth flexible surfaces.
- Prevention of chronic soreness from rigid denture bases.¹¹

Precautions¹²

- Thickness of denture base should be at least 3 mm.
- Seal should be perfect and should be checked for micro leakage

- Denture care instructions should be given to the patient.

- In case the liquid leaks out, the patient should inform the dentist and the denture should be refilled.

- Repair is possible if the sheet gets ruptured and can be replaced over preserved stone cast.¹²

In this case, polyethylene thermoplastic clear sheet (Biostar vacuum forming machine, Scheu-dental, Germany) was used because of its softness, flexibility and biocompatibility. Glycerin was used because it is colorless, odorless, viscous, and biocompatible.¹³ The adhesive used is n-butyle-2 cyanoacrylate, which is used in surgery as an alternative to suturing and as a protective covering over ulcers etc.¹⁴

Conclusion

Fibrous ridges pose a prosthodontic challenge for the achievement of stable and retentive dental prostheses. From its inception to now dentistry has covered great milestones in terms of invention, innovation and precision which aim to provide us with better working conditions and increased comfort for both dentists and patients.¹⁵ Ultimately, Devan's dictum holds true "Our objective should be perpetual preservation of what remains, rather than meticulous reconstruction of what is lost." When considering conventional prosthodontics, there are a variety of techniques available to address the problems caused by the unsupported tissue during denture construction. Liquid-supported denture by acting as a continuous reline provides solution to some problematic prosthodontic situations like patients with combination syndrome, bruxism or clenching habits, in or those patients with atrophic ridge and so forth. The betterment of overall health status of elderly can improve the activity of daily living and the quality of life of them as well.¹⁶

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References

1. Crawford RW, Walmsley AD. A review of prosthodontic management of fibrous ridges. *Br Dent J* 2005;199:715-9.
2. Kelly E. Changes caused by a mandibular removable partial denture opposing a maxillary complete denture. *J Prosthet Dent* 2003;90:213-9
3. Magnusson BC, Engström H, Kahnberg KE. Metaplastic formation of bone and chondroid in flabby ridges. *Br J Oral Maxillofac Surg* 1986;24:300-5.
4. Chase WW. Tissue conditioning using dynamic adaptive stress. *J Prosthet* 191;11:804-15
5. D. A. Atwood, "Post extraction changes in the adult mandible as illustrated by microradiographs of midsagittal sections and serial cephalometric roentgenograms," *The Journal of Prosthetic Dentistry*, vol. 13, no. 5, pp. 810–824, 1963.
6. D. Kakade, S. Athavale, S. Shingote, and B. Dammani, "Liquid-supported denture: a gentle option," *Journal of Indian Prosthodontist Society*, vol. 7, no. 1, pp. 35–39, 2007.
7. C. L. Davidson and G. Boere, "Liquid-supported dentures, part I: theoretical and technical considerations," *The Journal of Prosthetic Dentistry*, vol. 63, no. 3, pp. 303–306, 1990.
8. D. Kakade, S. Athavale, S. Shingote, and B. Dammani, "Liquid-supported denture: a gentle option," *Journal of Indian Prosthodontist Society*, vol. 7, no. 1, pp. 35–39, 2007
9. Davidson CL, Boere G. Liquid-supported dentures. Part I: Theoretical and technical considerations. *J Prosthet Dent* 1990;63:303-6.
10. W. W. Chase, "Tissue conditioning utilizing dynamic adaptive stress," *The Journal of Prosthetic Dentistry*, vol. 11, no. 5, pp. 804–815, 1961.

11. Boere G, de Koomen H, Davidson CL. Liquid-supported dentures. Part II: Clinical study, a preliminary report. *J Prosthet Dent* 1990;63:434-6.
12. Razek M, Mohamed Z. Influence of tissue-conditioning materials on the oral bacteriologic status of complete denture wearers. *J Prosthet Dent* 1980;44:137-42.
13. Keni NN, Aras MA, Chitre V. Management of labby ridges using liquid supported denture: A case report. *J Adv Prosthodont* 2011;3:43-6.
14. Mody PV, Kumar G, Kumar M, Shetty B. Liquid supported denture-management of labby ridges. *Contemp Clin Dent* 2012;3:323-5.
15. Avani *et al*. CAD/CAM in restorative Dentistry: A review. *BBB* 2014;2:591-597. Datta *et al*. Relationship of Activity of Daily Living with Quality Of life. *BBB* 2014;2:757-764.



Figure 1: Flabby maxillary edentulous



Figure 2: Wax spacer



Figure 3: Anterior small tray with guidance rod



Figure 4: Both trays seated on cast



Figure 5: Palatal impression using light body polyvinylsiloxane



Figure 6: Palatal impression using light body polyvinylsiloxane

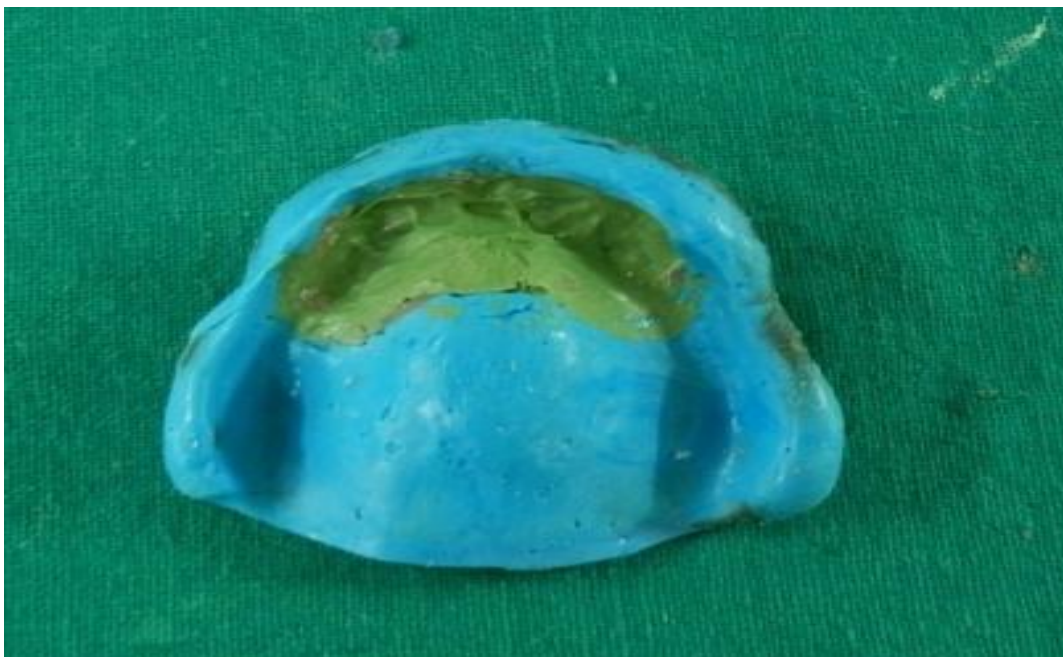


Figure 7: Second encompassing impression using medium consistency silicone impression material

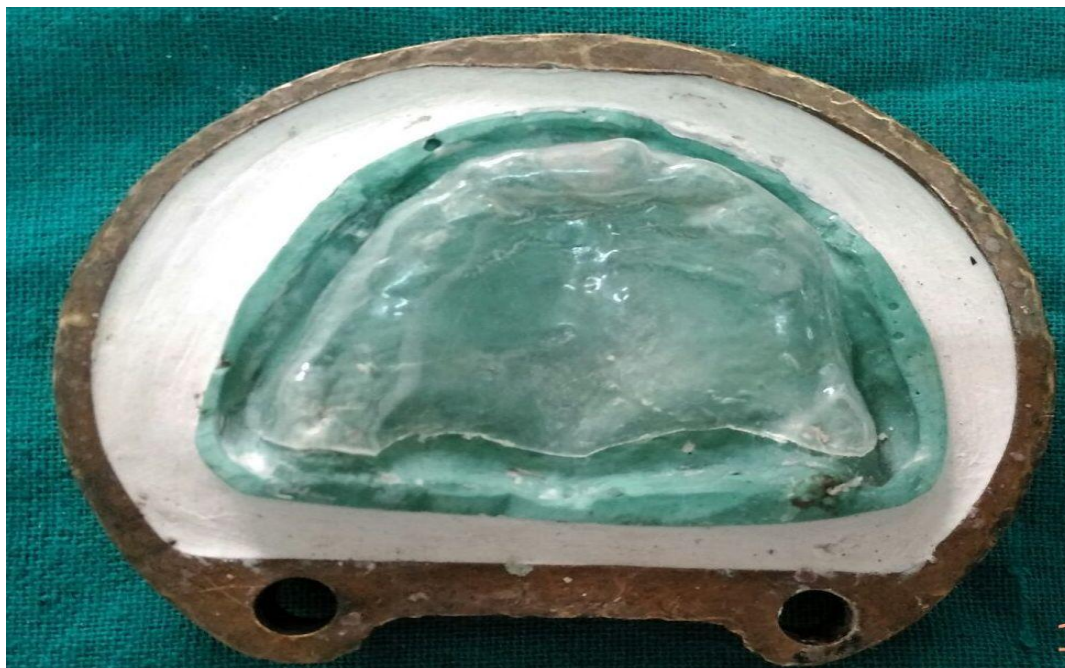


Figure 8: 1 mm thick sheet placed on the invested master cast prior to packing



Figure 9: 1 mm thick sheet being removed from the processed denture at recall appointment



Figure 10: Putty index of tissue undersurface of denture



Figure 11: Stone cast poured from the putty impression to mark the exact junction of polyethylene sheet



Figure 12: Vacuum heat-pressed polyethylene sheet (0.5 mm) thick

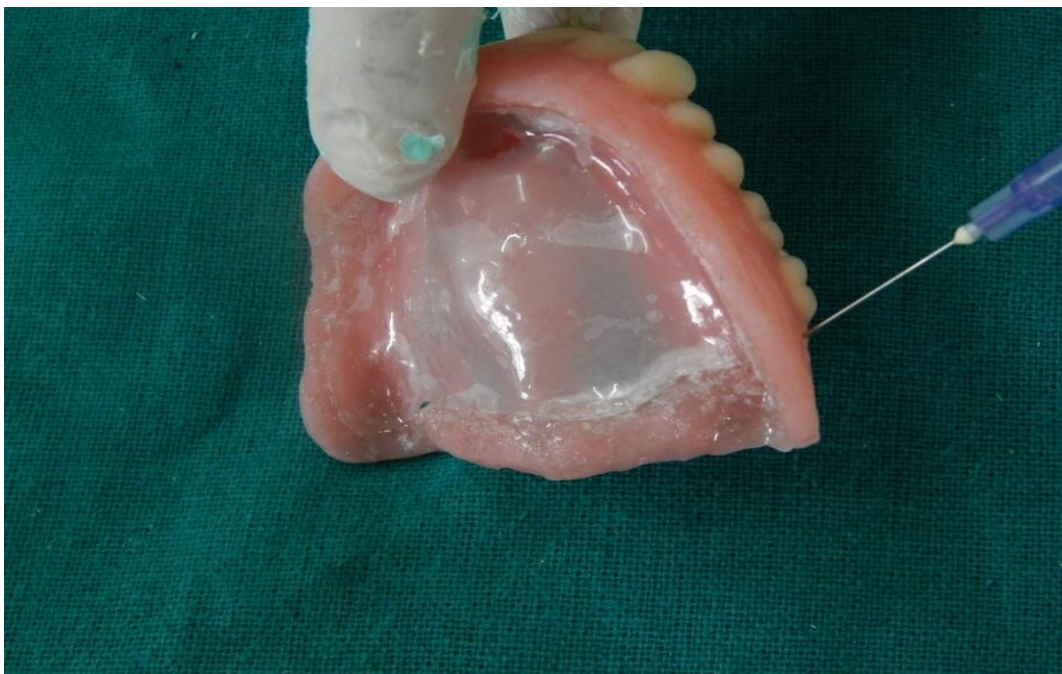


Figure 13: Incorporation of glycerin as a liquid medium



Figure 14: Incorporation of glycerin as a liquid



Figure 15: Maxillary liquid supported complete



Figure 16: Intraoral view of maxillary and mandibular complete dentures



Figure 17: Intraoral view of maxillary and mandibular complete dentures



Figure 18: Pre-operative view



Figure 19: Postoperative view