

Designating and Managing the Flabby Ridges: A Case Series

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Abstract:

Complete denture therapy is an age-old form of dental treatment. Flabby ridge poses a clinical challenge towards the fabrication of a successful prosthesis. These ridges lead to extreme resorption of the maxillary and mandibular denture bearing areas which results in depressed appearance of cheeks, unstable and non retentive dentures with associated pain and discomfort.

This article describes the step by step rehabilitation procedures of four patients with flabby ridges using special impression techniques and materials.

Keywords: Flabby ridges and different impression techniques

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Introduction:

A fibrous flabby and movable ridge is a superficial area of soft tissue in the anterior region of the maxillary or mandibular alveolar ridge affecting patient comfort and oral health including the hard and soft tissues of the ridges and ultimately leading to chronic irritation and resorption. These consequence leads to loss of retention, stability and support. It usually occurs when natural teeth opposes an edentulous ridge. It could also arise as a result of unplanned or hysterical dental extractions. Displaceable, hyperplastic or flabby tissues are commonly seen in combination syndrome reported by Kelly in 1972 or when extensive bone resorption has occurred.^{1,2} The reported prevalence for this condition also varies among investigators, but it has been observed in up to 24% of edentulous maxillae, 5% of edentulous mandible and in both jaws most frequently in the anterior region.³ Flabby ridges are typically composed of mucosal hyperplastic and loosely arranged fibrous connective tissue as well as more dense collagenised connective tissue. Masticatory forces can displace this mobile denture-bearing tissue leading to loss of peripheral seal. Forces exerted during impression making can result

in distortion of the mobile tissue.⁴ Unless managed appropriately by special impression technique such 'flabby ridges' adversely affect treatment and results of complete denture prosthesis. Many impression techniques have been proposed to help overcome this difficulty.⁵

This article emphasizes on different impression techniques for making impressions of denture bearing areas containing flabby ridges, which uses a simplified technique and more widely used impression materials.

All the patients are treated in the Department of Prosthodontics and Crown & Bridge M.I.D.S.R Dental College, Latur with a chief complaint of replacement of missing teeth in upper and lower arches and ill fitting dentures.

CASE REPORT I:

The patient was a denture wearer for the last 3years also using during sleep at night without giving rest to the tissues and described the existing denture as "loose-fitting". On examination the patient was completely edentulous with maxillary and mandibular arches. In anterior canine to canine region both maxillary and mandibular ridges were

flabby (fig 1). A treatment plan was formulated to fabricate a complete denture with the modification in the impression techniques to achieve minimum displacement of denture during function and maximum retention, stability and support.

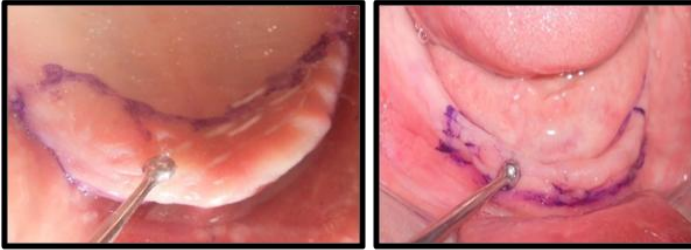


Figure 1: Maxillary and mandibular flabby ridge

Selective perforation tray technique:

A preliminary impression was made in stock tray with irreversible hydrocolloid impression material to ensure minimal distortion of flabby tissue and the impression was poured in dental stone. The displaceable areas were identified on the cast. On the maxillary cast, a spacer wax was adapted along the mid palatine raphe and additional relief with double thickness spacer wax of 3mm was given in the flabby area. On mandibular cast also the double thickness spacer wax of 3mm thickness adapted to provide extra relief in the flabby region (fig 2).



Figure 2: Special tray with relief at flabby area

Maxillary custom tray with “supporting” tray covering areas of flabby tissue with the handle placed at the center of the palatal area. Mandibular custom tray was fabricated with handle in premolar region. Border molding was done for both maxillary and mandibular arch using low fusing modeling plastic impression compound (green stick).The spacer wax was then separated from the tray and

multiple holes were drilled in the region of the flabby tissue using round bur No.8 (fig 3).



Figure 3: Border moulding with relief holes at flabby ridge area

A final impression with light bodied silicone was made(Fig 4), followed by face bow record, articulation and teeth arrangement with minimum occlusal table to reduce the pressure transmitted to the underlying flabby ridges and delivered the complete denture prosthesis (fig 5).



Figure 4: Final impression



Figure 5: Final denture

CASE REPORT II:

Clinical examination revealed maxillary and mandibular edentulous ridge with flabby ridge on the maxillary anterior region (fig 6). Window tray technique was used for this patient.



Figure 6: Maxillary flabby ridge

Zafrulla Khan's Window technique:

Zafrulla Khan has described a commonly used technique in impression making of flabby tissue. Preliminary impression was made in a stock tray with irreversible hydrocolloid impression material. Spacer wax of 1mm thickness was adapted over the cast and additional relief with double thickness spacer wax of 3mm was given in the flabby area, custom tray was fabricated in the conventional manner. The border molding was done with low fusing modeling plastic impression compound (green stick). Window was created in the custom tray in the flabby ridge area (fig 7, 8).



Figure 7: Window created in flabby ridge area



Figure 8: Final impression except flabby ridge area

Secondary impression was made with light-bodied silicon and impression plaster material was injected over the window corresponding to the flabby ridge area. Once the material was set, impression was removed from the patient's mouth. Subsequently, conventional treatment procedures of face-bow record, articulation and teeth arrangement were done to deliver complete denture prosthesis (fig 9).

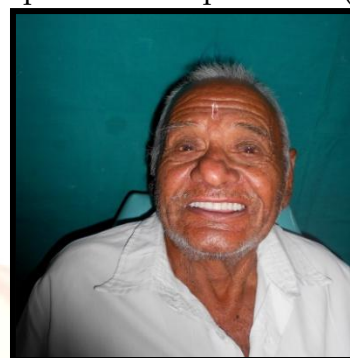


Figure 9: Final denture

CASE REPORT III**Devlin technique/ Palatal splinting using a two-part tray system:**

In 1964, Osborne described an impression technique involving two overlying impression trays used for recording maxillary arches with displaceable anterior ridges. The aim of this technique is to maintain the contour of the easily displaceable tissue while the rest of the denture bearing area is recorded.

Clinical examination revealed maxillary and mandibular edentulous ridge with flabby ridge on the maxillary anterior region (fig 10).

Palatal split tray technique was used. Preliminary impression was made in a stock tray with irreversible hydrocolloid impression material. Using Devlin technique, a palatal tray was fabricated with a 2mm wax spacer, which was used to create space on the palatal aspect of the mobile area and extends to the crest of the ridge (fig 11). A centrally positioned rod was placed on the palatal tray and proclined anteriorly to allow a second special tray to be guided in an oblique upward and backward direction to envelope the palatal tray (fig 11, 12 and 13). The second special tray accurately encompasses the

palatal tray. Border molding was done on second special impression tray with palatal tray in mouth (fig 14). The displaceable tissues were recorded with zinc oxide eugenol impression material in the palatal tray in an undisplaced position (fig 15). And the final impression was made completely encompassing the

palatal tray with light-bodied impression material (fig 16). Subsequently, conventional treatment procedures of face-bow record, articulation and teeth arrangement were done to deliver complete denture prosthesis. (Fig. 17)

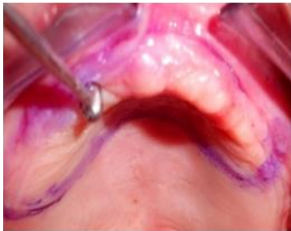


Figure 10: Flabby ridge



Figure 11: Palatal Tray with Proclined Guidance Rod



Figure 12: Second Tray Seated on Palatal Tray



Figure 13: Both the trays assembled



Figure 14: Border Moulding



Figure 15: Flabby tissues recorded with zinc oxide eugenol paste impression material



Figure 16: Second special tray impression made completely encompassing the palatal tray with light viscosity elastomeric impression material



Figure 17: Final denture

CASE REPORT IV***Magnetically retained custom tray technique:***

Clinical examination revealed maxillary and mandibular edentulous ridges with flabby ridge on the maxillary anterior region, (Fig 18) as the patient had a history of continuous denture wear without allowing tissue rest. A diagnostic impression of the maxillary arch was made with irreversible hydrocolloid (Tulip, Cavex, RW Harlem, The Netherlands), and the diagnostic cast was prepared with type II gypsum product. The introduction and placement of the stock impression tray with finger pressure caused excess tissue displacement of maxillary residual ridge. Due to the lack of stable area on the ridge, the mode of stabilization of the custom tray during impression making needed to be addressed. A new method, a magnetically retained custom tray, was planned.

Construction of magnetically retained custom tray:

On the diagnostic cast of the maxillary edentulous ridge, the denture-bearing area was divided based on displaceability of tissues as the palatal vault region (Region A—relatively stable) and residual ridge region (Region B with generalized tissue displacement) (Fig 19). Corresponding to the same division, the custom trays were made in two parts. They were designed as palatal and ridge sections, which will be referred to here after as tray A and tray B, respectively.

Fabrication of Tray A:

A single thickness of modeling wax (Surana, Mangalore Dental Corporation, Mangalore, India) was adapted on region A, and tray A was prepared with auto-polymerizing resin (DPI-RR Cold Cure, The Bombay Burma Trading Corporation, Mumbai, India). Tray A covered all of region A and extended around the hamular notch region of the cast. Three depressions (denoted as D1, D2, and D3 hereafter) were developed in tray A; one anteriorly (D1) and two postero-laterally (D2, D3). Ferrite magnetic discs (6-mm diameter) (denoted as M) (M/S Sidhi enterprises, New Delhi, India) of 0.35 telsa magnetic field were placed in each of the three depressions (magnets in the three depressions will be denoted as MD1, MD2, and MD3 hereafter). (Fig 20)

Fabrication of Tray B:

Tray B was fabricated with auto-polymerizing resin after covering the hyperplastic ridge in region B with two layers of modeling wax. The wax was placed 4 mm short of the sulcus, and the tray was fabricated 2 mm short of the sulcus. Three horizontal resin extensions were constructed in tray B to engage the depressions in tray A. Another set of three ferrite magnets were placed in these horizontal resin extensions (Fig 21). The magnets were secured in place with auto-polymerizing acrylic resin.

Tray Assembly:

Trays A and B were placed in their respective areas on the diagnostic cast. When assembled, the depressions in tray A were engaged by the horizontal resin extensions of tray B. The custom tray remained stable due to the attraction between the unlike magnetic poles of tray A (MD1, MD2, and MD3) and tray B (MH1, MH2, and MH3). There was a uniform clearance of 1 to 2 mm between trays A and B all around, except in the areas where the magnets engaged each other (Fig 22).

Impression Making With Self-Retaining Custom Tray:

The assembled tray was placed intra-orally to develop a functional border seal. The low fusing green stick (DPI) was used on the borders of tray B and on the posterior palatal seal region of tray A for functional border molding. During this step the tray was stabilized with finger support over the tray A region. The patient was asked to perform functional movement to develop labial and buccal borders. At the completion of this step, the trays were detached for final impression making. The placement and orientation of trays A and B in stages were rehearsed many times so the tissues would be recorded at rest without disturbance from the operator's finger pressure. The zinc-oxide eugenol impression paste (DPI) was injected over region A, and the impression of this portion was completed first with tray A stabilized with finger pressure (Fig 23). Maintaining tray A in place on the palate, the low-viscosity elastomer was gently syringed over the displaceable tissues of the ridge only to the extent required (Fig 25). The partially filled tray B was gently oriented in correct relation to tray A so the magnets were aligned in line (i.e., MH1-MD1, MH2-MD2, and MH3-MD3).



Fig: 18 Flabby ridge

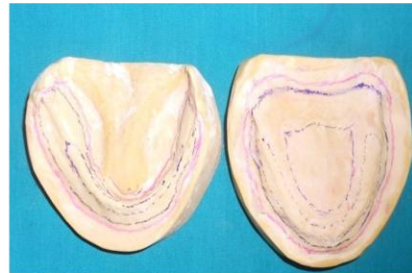


Fig: 19 Diagnostic cast with the regions marked: region A – palatal vault, region B – ridge portion.

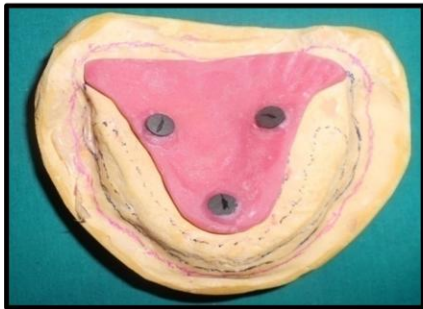


Fig: 20 Fabrication of tray A. Magnets in the depressions

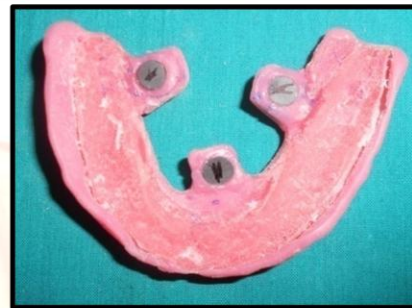


Fig: 21 Fabrication of tray B. Horizontal resin extensions of tray B and Magnets in place on the horizontal resin extensions

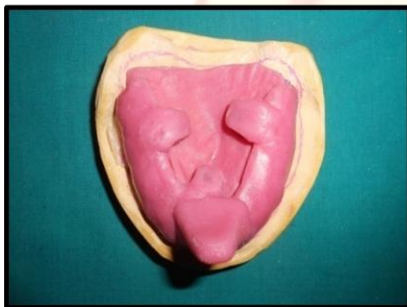


Fig: 22 Two portions of the tray assembled.



Figure: 23 Two stages of impression making. (A) First stage- Impression making of region A with tray A; (B) Application of impression material for second stage impression making of region B with Tray B.

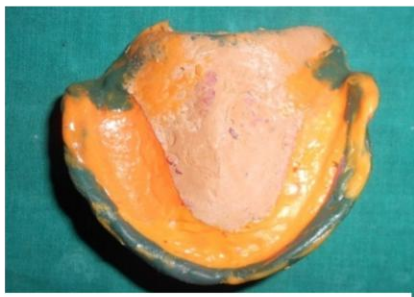


Fig: 24 Final impression with magnetically retained custom trays



Fig: 25 Insertion of removable maxillary complete denture

Now when the power of magnetic attraction was felt, the hold on tray B was released. The tray was self-retained due to the pull of magnetic force. Finger pressure was totally removed. Excess material escaped through the spacing between the two portions of the tray. The tray was stabilized with magnetic attraction alone. After allowing sufficient time for the material to polymerize, the tray was removed in one section. The amount of close adaptation to the tissues was appreciable in the details recorded. The master cast was prepared with type III gypsum product, and the denture base was fabricated with clear auto-polymerizing acrylic resin (Veracril, Mangalore Dental Corporation, Karnataka, India). The denture base showed uniform adaptation to the tissues, and there was no evidence of tissue blanching or tissue rebound. The static method of jaw relation using bite registration material (Virtual, Ivoclar Vivadent, Bendorerstrasse, Liechtenstein) was used to further eliminate tissue compression due to unequal occlusal contacts. An occlusal scheme with very minimal incisal guidance was used. The acrylic teeth (Dentsply Delhi, India) were modified to have minimal to almost zero cusp degree to decrease the lateral forces. Wax try-in for the maxillary complete denture was carried out, and the dentures were processed with heat-polymerizing denture base resin (DPI India).

DISCUSSION:

The success of a complete denture relies on the ideology of retention, stability and support. The Prosthodontist skillfulness lies in applying these principles competently in critical situations. Dentures constructed on flabby ridges without any special care for the same, may cause discomfort to the patient and malfunction of the prosthesis. Surgical excision of flabby tissue is one of the treatment options. But, however, in majority of the cases it reduces the sulcus depth and arise a need of vestibuloplasty. Ridge augmentation is an invasive treatment option, as it has the risk of negative response of graft material along with the need for additional surgery for graft harvesting.⁶ The surgical intervention in the form of fibrous tissue removal or placement of implant retained prosthesis causes their own disadvantages of medical condition of elderly

patients, shallow ridge, treatment time, cost, etc. A conventional prosthodontic solution may avoid problems associated with surgery. Prosthodontic management of such conditions is a feasible and non-invasive option. In these cases impression techniques used for recording the ridge has paramount.⁷ The conventional muco-compressive impression techniques result in an unstable denture.⁸

The use of selective pressure or minimally displace impression techniques helps to overcome some of these limitations. The use of holes, windows and wax relieves reduces the hydraulic pressure and minimizes the displacement of the bearing tissues.^{3,4} Using the palatal splinting technique is conceivable that a degree of distortion, although minimal, may occur by anterior distortion during the first stage and compression of the ridge at second impression stage.^{9,10} The magnetic retention ruled out finger pressure and provided an easy and stable orientation of special trays. The magnets also acted as tissue stops, avoiding over compression of displaceable tissue of crest.¹¹

CONCLUSION:

An accurate impression is mandatory for good prosthetic service. However, making of a good impression is not a mechanical job, but involves a sound knowledge of oral anatomy, physiology and dental material sciences. The dentist's ability in these three aspects is severely tested while dealing with compromised situations. No doubt presence of highly displaceable denture bearing tissue presents a difficulty in complete denture fabrication; with modified impression techniques these ridges can be managed effectively by conventional prosthodontic without any additional clinical visits like the patients with normal edentulous ridges. The technique described in this case series does not involve extra-clinical stages in the construction of complete denture, thereby keeping clinical time to minimum. The impression technique can be accomplished relatively quickly and uses the material with which the general practitioner as apprehensively uses materials that they have little experience of using. Light-bodied elastomeric impression material are dimensionally stable and do not need to be poured

immediately. They are also less brittle than plaster of Paris and do not need to be handled as carefully.

REFERENCES:

1. Kelly E. Changes caused by a mandibular removable partial denture opposing a maxillary complete denture. *J Prosthet Dent* 1972; 27:140-150.
2. Xie Q, Närhi TO, Nevalainen JM, Wolf J, Ainamo A. Oral status and prosthetic factors related to residual ridge resorption in elderly subjects. *Acta Odontol Scand* 1997; 55:306-13.
3. G. E. Carlsson. "Clinical morbidity and sequelae of treatment with complete dentures," *Journal of Prosthetic Dentistry* 1998; 79:17-23,.
4. Crawford RW, Walmsley AD. A review of prosthodontic management of fibrous ridges. *Br Dent J* 2005; 199:715-9.
5. Lynch CD, Allen PF. Management of the flabby ridge: Using contemporary materials to solve an old problem. *Br Dent J* 2006; 200:258-61
6. Bindhoo YA, Trimurthy VR and Anjana K. Complete mucostatic impression: A new attempt. *J Prosthodont* 2012; 21: 209-14.
7. Finbarr A. Management of flabby ridge in complete denture construction. *Dent Update* 2005; 32: 524-8.
8. Benaiffer A, Surendra A and Anup M. Management of flabby ridge: A case report. *Ind J Dent Sci* 2011; 3(2): 20-2.
9. Osborne J. Two impression methods for mobile fibrous ridges. *Br Dent J* 1964; 117:392-94.
10. Devlin H. A method for recording an impression for a patient with a fibrous maxillary alveolar ridge. *Quint Int* 1985; 6: 395-97.
11. Y. A. Bindhoo V. R. Thirumurthy & Anjana Kurien. Complete Mucostatic Impression: A New Attempt. *Journal of Prosthodontics* 2012; 21:209-14.