

# Management of Flabby Tissue: A Review

Dr. Swapna. C<sup>1</sup>, Dr. Sheejith. M<sup>2</sup>, Dr. Eaketha. P. Lokesh<sup>3</sup>

**Abstract:** 'Fibrous' or 'flabby' alveolar ridges pose significant problems for the provision of stable and retentive dental prostheses for affected patients. In particular, problems arise during the act of impression taking, when forces cause the mobile denture bearing tissues to become distorted. The purpose of this paper is to review the impression techniques that can be used to optimize the treatment of edentulous patients with 'flabby' alveolar ridges.

**Keywords:** flabby tissue / ridge, combination syndrome, massad's technique, lynch and allen technique, hobcrick technique, window technique, osborne, liddledow, magnesson technique, walter, allen mack technique

## 1. Introduction

Flabby ridge (displaceable ridge/fibrous ridge) is a clinical condition that affects the retention, stability and support of a prosthesis. According to GPT-4 & GPT-9, it is an "excessive tissue" or a "movable tissue"(1) It is a tissue adaptation to overcome the changes caused by residual ridge resorption in providing adequate support which relining procedures will otherwise do.(2)Flabby ridge is actually replacement of alveolar bone by fibrous tissue with poor denture supporting properties, most commonly seen in the anterior maxillae as a result of combination syndrome (Kelly Syndrome) due to excessive load of the residual ridge.(3) Flabby ridges are composed of mucosal hyperplasia and loosely arranged fibrous connective tissues as well as denser collagenase connective tissue. In the soft tissue, varying amounts of metaplastic cartilage &/ or bone has been reported. (4)(5)Flabby ridges could arise as a result of unplanned or uncontrolled dental extractions, long term denture wear without maintenance, poor systemic health, trauma from the denture base, malocclusion, ridge resorption or due to aberrant forces on the prosthesis.(6)(7)(8)

## 2. Management of Flabby Ridge

The three main approaches to manage a flabby/ displaceable ridge includes: (4)

- a) Surgical removal of fibrous tissue prior to conventional prosthodontics.
- b) Implant retained fixed or removable prosthodontics.
- c) Conventional prosthodontics without surgical intervention.

### a) Surgical removal of fibrous tissue

Surgical removal will produce a firm denture-bearing area that enhances the stability of the prosthesis. It is indicated for pendulous ridges that interfere with denture stability. This technique can be considered only if patient's health is satisfying and if there is no other systemic complications. It is contraindicated if there is little or no alveolar bone. There exist arguments regarding the surgical removal, as the fibrous part provides a cushioning effect, which reduces trauma to the underlying bone. The removed tissue often requires prosthetic replacement by denture base material, which can increase the bulk of the prosthesis. Also, retention of the prosthesis is adversely affected by the significant loss of sulcular depth, that aid in border seal.(3)(4)

### b) Implant retained prosthesis

Implant retained fixed or removable prosthesis offer better retention, stability and oral function. Such prosthesis are usually economical, as fewer implants are used for over dentures. However, recurrent cost due to maintenance can be considerable.(9) Various reports shows the success rates for maxillary implants to as low as 78.7%.(10)This could be due to the placement of shorter implants into highly vascular, poor volume, low-density bone. (3)Considering the time and finance, the initial cost and long term maintenance cost are high. Other factors that must be considered while placing an implant supported prosthesis includes surgical factors, general health of the patient, risk of surgical complications or implant failure & the patient's convenience.(11)

### c) Conventional prosthetic management

Variety of impression techniques are practiced in conventional prosthetic management. Uncontrolled displacement of the mobile fibrous tissue from its resting position by forces exerted during conventional impression recording results in an impression with distorted denture bearing area. Basically, three impression principles has been reported in numerous literatures to overcome this problem. This includes:

- I. Mucostatic (Non-displasive) impression technique (4)(8)(12): that records the un-displaced denture bearing area at rest. As the resultant denture is more closely adapted to the underlying tissues at rest, it is theoretically more retentive. But the occlusal forces will not be evenly distributed across the underlying denture bearing area.
- II. Mucocompressive (Displaceable technique)(13): aims to compress the loose flabby tissue to allow functional support from it by replicating the ridge contour of the ridge during compression by occlusal forces.
- III. Selective pressure technique: where some denture bearing tissues are displaced, & others are not. A close fitting custom tray and high viscosity impression material are used, the soft tissues at the vibrating line on the palate are compressed, while the tightly bound tissue on the hard palate is not.(4)(13)(14)

At present, there is lack of scientific evidences to support the superiority of any technique over the other. Various authors have described techniques to record the hyperplastic fibrous tissue.

### 3. Impression Techniques for Recording Flabby Tissue

Numerous techniques has been described in literatures for recording flabby ridges. These include the following:

1) Liddledow technique (1964)

In this technique, two separate impression materials are used in a custom tray using plaster of paris over flabby tissue, and zinc oxide eugenol over normal tissue.(15)

2) Crawford & Walmsley

They used two different materials and two custom-built trays, which was similar to Liddledow's technique.(16)

3) Osborne (1964) (15)

Special impression technique whereby two overlying impression trays were used for recording maxillary arches with displaceable anterior ridges. This technique aimed to maintain the contour of the easily displaceable tissue while the rest of the denture bearing area is recorded.

4) Watson's (1970) described the "window technique"

Here a custom tray is made with window over flabby tissue. The window minimized the movement of the flabby ridge tissue during function. This technique involves recording of definitive impression in two steps. A mucocompressive impression of normal tissues is first made using the custom tray and zinc oxide eugenol impression paste. In the second stage, a low viscosity mix of plaster of Paris is painted over flabby tissue through the window.(4)(8)(16)

5) Zafarulla khan technique (1981)(17)

The technique is similar to Watson's window technique. The custom tray is modified with posterior handles and anterior opening for unsupported tissue. The tray is painted with an adhesive and regular body impression material is used for the final impression. The excess material is trimmed to the outline of the aperture. The unsupported movable tissue is recorded by brushing on impression plaster

6) Jone D Walter technique

The technique is similar to Watson's window technique.(10)He recorded the healthy denture bearing tissues with zinc oxide eugenol paste and the displaced fibers of tissue with impression plaster

7) Devlin (1985)

Modified Osborne's approach by using a locating rod that as positioned in the center of the palatal tray, but proclined to allow the second special tray impression to be guided in an oblique upward and backward direction to envelope the palatal tray. The palatal tray will accurately locate the second part special tray using a stop, thereby allowing for a pre-planned even thickness of impression material.(4)

8) Magnusson et al. (1986) (5)(16) used zinc oxide eugenol paste for normal tissues and a plaster material for flabby area into a custom tray.

Watt & McGregor (1986), recently reviewed by Lynch and Allen(2003), used another impression technique with a modified custom tray into which is applied an impression compound.(5)

9) William H Filler(18)

He has described a technique using two impression trays. The second tray is accommodated on the first tray. In the first tray, light body impression material is used as the corrective wash material. Adhesives are painted over the areas not covered by the first impression in second tray and impressions are recorded. The two trays are held tightly together until the impression sets and the final impression is removed as a single unit.

10) Hobkirk technique

In this technique, a *single custom trays* used. The secondary impression is recorded with heavy bodied addition silicone. The areas of movable tissues are cut out and relief holes are made. Wash impression is recorded using light body impression material. (14)

11) The Massad's technique (14)(19)

This technique makes final impression in single visit by eliminating the need to fabricate custom tray from cast obtained from preliminary impression. An edentulous, perforated stock tray is selected according to patient's ridge size and width. Tissue stops are created using heavy viscosity impression material. For this, spherical pieces of material are placed in one in anterior region, one in each posterior region, and one in palatal area (maxillary tray). Then the tray is placed in patient's mouth allowing for 2-3 mm of space. The stops were then allowed to set in patient's mouth. This procedure is followed by border molding using heavy viscosity impression material. After evaluating the extension of the border details, final impression is recorded using two different viscosity materials. Heavy body impression material is used over tuberosity region and light body impression material over the remaining tissue surface Different viscosities of impression material were selected so as to record the load bearing area in the functional state and the other areas that is flabby tissue and relief areas, under minimal displacement.

12) Allan Mack's 'Splint Method'(2)

It is used if tissues are excessively and exceptionally flabby. Loosely fitting tray or a special tray made with heavy relief over the flabby area is taken. Plaster is mixed and applied over the flabby area to a thickness of about 3 mm and is allowed to set. Tray is filled with second mix of plaster and the impression is made. The initial coating of the flabby areas thus acts as a 'splint'. It gets removed with the second impression

13) Lynch & Allen technique (2003)(8)(20)

In this technique, impression compound is applied to a modified custom tray. The thermoplastic properties of this material are then manipulated to simultaneously compress the 'normal tissues', while avoiding displacement of the 'flabby tissues' using the same material and impression tray. Over this manipulated impression compound, a wash impression with zinc-oxide and eugenol is made. The buccal shelf area (primary stress bearing area) acts as a stopper for the tray in the final impression procedure. The remaining borders of the tray will be recorded by selective pressure technique using green stick compound. The final impression will be recorded using a monophasic impression silicone (its thixotropic property ensures adequate flow under pressure)

## 14) Modified Fluid wax impression (21)

According to Applegate, the use of fluid wax in impression making has some advantages:

- 1) It can be easily controlled to gain maximum coverage
- 2) It can be corrected readily
- 3) It can be used to accurately determine the extent of the mucobuccal reflections
- 4) It can be used to direct pressure to the load-bearing areas, specifically, the buccal shelves and the slopes of residual ridges in the mandible.

Tan K.M, Singer. M. T, Masri R, Driscoll CF (2009) suggested a functional impression technique using fluid wax that captures the primary and secondary load-bearing areas without distortion of the residual ridge. This technique is particularly used in severely resorbed mandibular ridges.

In this technique, a custom tray is fabricated by creating a window over the crest of the residual ridge, which opens above the displaceable mandibular ridge. Melt the impression wax in a water bath and apply onto the borders of the tray with a wax spatula until a glossy surface is visible. Apply adhesive on the tray surrounding the window opening and allow it to dry. Place the impression tray on the ridge and inject vinyl polysiloxane impression material over the window opening. The low-viscosity elastomeric impression material is advantageous because it creates minimal pressure, produces accurate details, does not distort easily, and is easy to handle.

#### 4. Conclusion

Managing a patient with flabby maxillary ridge can be a challenging problem. Standard mucocompressive impression techniques are likely to result in a non-retentive, imprecise and unstable denture as the denture will be constructed on a model of the flabby tissue in a distorted state. Mucostatic techniques may not make the best use of the available tissue support and movement of the denture base relative to the support tissues may be a problem. The use of selective pressure or minimally displacive impression techniques should help to overcome some of these limitations. With modified impression techniques, these ridges can be managed effectively without any additional clinical visits as compared to patients with normal edentulous ridges

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