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## Impression techniques for management of flabby ridges in complete denture patients: A review of literature

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### Abstract

Making of a final impression of flabby tissue with minimal or no displacement of tissue and better stability of the denture. A fibrous or flabby ridge is a mobile or extremely resilient alveolar ridge that becomes displaceable due to fibrous tissue deposition. Inadequate support, stability, and retention of a complete denture are the problems encountered in these patients. This article represents a review of different impression techniques for the management of flabby ridge in complete dentures. These impression techniques helped in recording flabby tissue with minimal displacement and hence enhanced the stability, support, and retention of the denture.

**Keywords:** Flabby ridge, impression techniques, hobkirk's technique, massad's technique, lynch and allen's technique

### Introduction

Edentulism is an important global public health issue due to its high prevalence which exceeds 10% in adults aged  $\geq 50$  years and the associated disability<sup>[1, 2]</sup>. A flabby ridge becomes displaceable due to fibrous tissue deposition. It is developed when hyperplastic soft tissue replaces the alveolar bone. It affects both maxillary and mandibular alveolar ridge but it is most commonly seen in the maxillary anterior ridge. Studies have shown that flabby ridge occurs in 24% of maxillary and in 5% of mandibular edentulous ridge<sup>[3]</sup>.

When the edentulous maxillae are opposed by natural mandibular teeth in the anterior region, these teeth cause trauma to the maxillary anterior ridge as all occlusal forces are directed to this area, resulting in severe bone loss and fibrous hyperplastic tissue formation. E Kelly described this condition as "combination syndrome".<sup>4</sup> Flabby ridge is also a common finding in long-term denture wearers due to trauma from denture bases or the result of unplanned and uncontrolled dental extractions<sup>[2, 5]</sup>.

Impression making of flabby ridge results in the displacement of fibrous tissue which later on recoils to its original position and dislodges the denture. Unless managed properly by special techniques, a flabby ridge adversely affects the support, retention, and stability of the denture. Various impression techniques have been described to overcome the problem of flabby tissue. This article describes three different impression techniques for recording flabby resorbed ridges, viz Hobkirk Technique· Massad's Technique, Lynch and Allen's technique<sup>[6-8]</sup>.

### Classification of management of flabby ridges

Flabby ridge is managed by following method:

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

### Surgical removal of the fibrous tissue

The outcome of this method is firm denture bearing area which enhances the stability of future

prosthesis. As with any surgical treatment option, the health of the patient must be taken into consideration. Removal is contraindicated in circumstances where little or no alveolar bone remains [9]. It can be argued however that the fibrous part of the ridge has a cushioning effect that reduces trauma to the underlying bone, which therefore should not be removed. The removed tissue often requires prosthetic replacement by denture base material; this can increase the bulk and weight of the prosthesis. Retention is also adversely affected by the significant loss of the sulcus depth which is important in aiding border seal [10, 11]. For conventional prosthodontics, preservation of what remains is more important. The flabby ridge may provide substandard retention for the denture base, it may be more desirable than no ridge at all [9, 12].

### Implant retained prostheses

- a) Fixed prosthesis
- b) Implant retained overdenture.

Fixed and removable implant-retained prostheses have potential benefits compared to conventional prosthodontics. It enhanced the stability, retention, and oral function. An implant-retained overdenture, in comparison to a fixed prosthesis, is initially economic and the surgery is often more straightforward. However, the recurrent cost due to maintenance can be considerable. Implants in the maxilla, which has a higher prevalence of flabby ridge, are not as successful as in the mandible. The success rates for maxillary implants have been shown to be as low as 78.7%.<sup>8</sup> It is thought that this could be due to the placement of shorter implants into highly vascular, poor volume, low-density bone.<sup>13</sup> The diminished alveolar bone volume in this subject group may result in restrictions on suitable implant sites or the need for bone augmentation [10]. In terms of both time and finance, the initial cost and long-term maintenance costs of these restorations can be high [13, 14]. Factors considered while going for implant retained prosthesis are fear of surgery, discomfort, and inconvenience, general health of the patient, and risk of surgical complications or implant failure.

### Conventional prosthetic management

Uncontrolled displacement of the mobile fibrous tissue from its resting position, forces exerted during conventional impression taking, results in a record of distorted denture bearing area. This problem can be managed by following impression technique:

Mucodisplacive impression technique is used to compress the loose flabby tissue to allow functional support from it by replicating the contour of the ridge during compression by occlusal forces. Whereas Mucostatic impression technique is achieved support from the other firm areas of the arch and maximizes retention. At present, the published evidence does not support the superiority of either of these techniques over the other. To overcome these problems, the following techniques are useful.

### Choice of technique

#### One part impression technique (Selective perforation tray)

It has been suggested that if the degree of mucosal displacement is minimal, then this modified conventional technique may be considered [15].

1. Preliminary impressions are taken in stock trays using low-viscosity alginate after appropriate border correction.
2. A spaced special tray is fabricated from the primary cast for use with a low viscosity impression material, such as impression plaster, low-viscosity silicone, or alginate.

3. Pressure on the unsupported, displaceable soft tissue can be minimized further by the use of perforations in the tray overlying these areas (Figs 1 to 3)



Fig. 1: Undisplaced mandibular ridge



Fig 2: Displaced mandibular ridge



Fig 3: Perforated special tray

### Controlled lateral pressure technique

Controlled lateral pressure technique was advocated by many authors for use with a fibrous (unemployed) posterior mandibular ridge [16, 17]. In this technique tracing compound (green stick) is used to record the denture bearing area using a correctly extended special tray. A heated instrument is then used to remove the greenstick related to the fibrous crestal tissues and the tray is perforated in this region. Light-bodied silicon impression material is then syringed onto the buccal and lingual aspects of the greenstick and the impression is gently inserted. The excess material is extruded through the perforations and theoretically, the fibrous ridge will assume a resting central position having been subjected to even lateral pressures.

### Palatal splinting using a two-part tray system

For recording displaceable anterior ridge in maxillary arches, Osborne described an impression technique [18]. The main goal of this technique is to maintain the contour of the easily

displaceable tissue while the rest of the denture bearing area is recorded with the help with previous denture a primary cast is fabricated. From this, a palatal tray is fabricated with wax being used to create space on the palatal aspect of the mobile area and extending to the ridge crest around the arch. In this acrylic resin palatal tray, a low viscosity zinc oxide paste impression is taken of the palate. An upward force is maintained until it is apparent that the mobile ridge is just beginning to have pressure applied to it. Once this has been set, a second special tray impression is made completely encompassing the first tray. It should be inserted from in front, backward, and the presence of the supporting zinc oxide should prevent backward displacement of the mobile ridge.

A neat modification of this approach was described by Devlin in 1985, in which a locating rod is 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 [19]. The palatal tray accurately locates the second part special tray using a stop, thereby allowing for a pre-planned even thickness of impression material (Figures 4-10)



Fig 4: Wax spacer

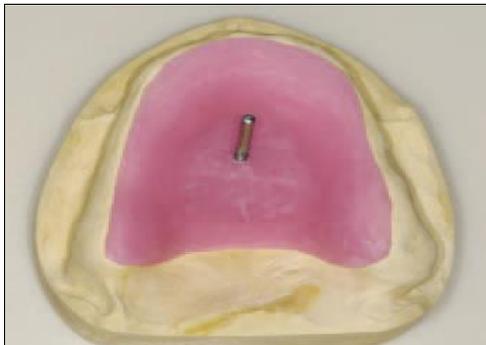


Fig 5: Palatal tray with proclined guidance rod & stop



Fig 6: Second tray



Fig 7: Both tray seated on cast



Fig 8: Palatal impression using ZOE

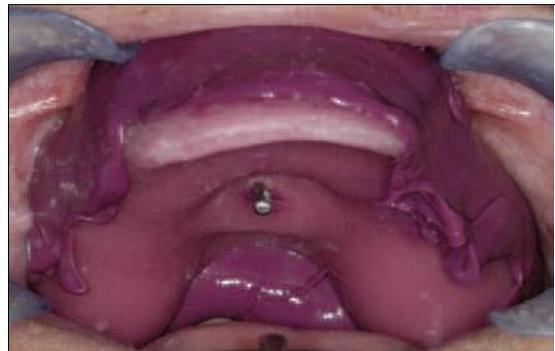


Fig 9: Second encompassing impression using silicone impression material

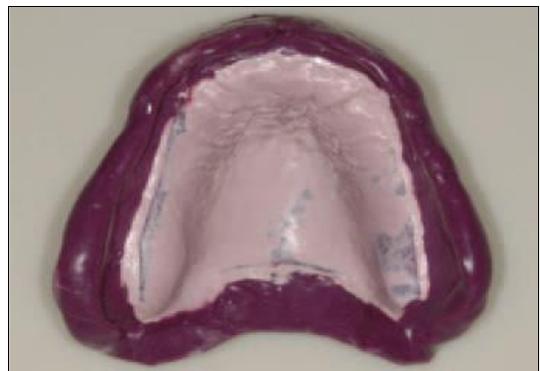


Fig 10: Finished impression

**Selective composition flaming with impression compound material**

In this method, first make a impression with alginate and pour a cast which reproduces a relatively undistorted ridge. In this cast now make an another impression with impression

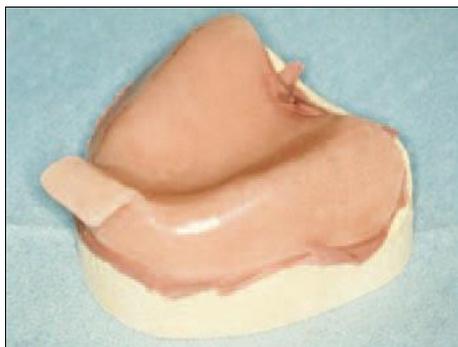
compound by using stock tray. After making an impression, The impression periphery is carefully softened and functionally trimmed. The fibrous part of the ridge can be outlined on the impression surface. The composition overlying the firm denture bearing areas is softened with a flame before the tray is seated under heavy pressure, attempting to replicate functional force. By performing the impression in this way, the original relatively undistorted shape of the fibrous tissues is retained while the tissues more capable of functional denture support are recorded in a displaced state [20].



**Fig 11:** Undisplaced maxillary ridge



**Fig 12:** Displaced maxillary ridge



**Fig 13:** Impression of primary cast



**Fig 14:** Impression compound



**Fig 15:** Marking of fibrous tissue boundaries



**Fig 16:** Transfer of compound impression

### Two-part impression technique

#### Mucostatic and mucodisplacive combination

Most commonly used method for recording displaceable tissues. This technique was first described by Osborne in 1964 for mandible arches. This is a popular technique where many authors ensured that the pressure exerted by the tray does not cause distortion of the mobile tissues [17, 18, 20, 21]

In this method, first make a primary impression and marked the displaceable tissue on impression which can be transferred on primary cast. Now a close-fitting special tray fabricated with cold-cured resin in which flabby ridge area is left uncovered. An alternative method described by Hobkirk, McCord and Grant, involves the removal of acrylic from a complete special tray creating a window over the displaceable area [16, 21].

An appropriate border correction is done with green stick compound supported mucosa is recorded with zinc oxide-eugenol or medium-bodied silicone. An impression of the displaceable mucosa is then recorded by applying or syringing a thin mix of impression plaster or light-bodied silicone.

Modification of the special tray after the more viscous impression material has been used to record the whole of the denture bearing area (including the displaceable area) previously described by McCord and Grant, could conceivably cause a degree of distortion in adjacent areas [16].

The design of this modified special tray can vary from a completely uncovered section of the arch to a window overlying the unsupported mucosa. In the fibrous anterior maxilla, modification of the handle position is often required. A rim handle design has the benefit of aiding the prevention of unset impression material falling to the back of the mouth when the patient is supine. The advantage of a window design means that the appropriate border correction can be undertaken and checked around the entire sulcus before the second stage of the impression is completed.



**Fig 17:** Rim handle design special tray



**Fig 18:** First stage impression



**Fig 19:** Second stage plaster of paris record of anterior ridge



**Fig 20:** Final impression

### Discussion

There are several literature concluded that surgical removal of the fibrous areas often results in a greater prosthodontic challenge. Where as Implant retained prostheses may offer a solution to the problems of stability and retention in fibrous ridge cases. However, they are not without their disadvantages i.e surgery, treatment time, cost, etc. A conventional prosthodontic solution may avoid these problems associated with surgery. Due to the obvious difficulties in the analysis of the success of prostheses constructed using the various impression techniques described, the clinical choice has fallen mainly to personal preference, based on analysis of theoretical principles. Various techniques have been recommended and there is controversy as to whether the mucostatic technique

which compresses the mobile tissue aims to achieve maximum support from it, or whether a mucostatic technique with the aim of achieving maximum retention should be employed.

While recording the flabby ridge, we have to keep this in our mind first, why patient came, patient presenting complained for example, instability during mastication or lack of retention during rest, speech, etc. The amount and position of displaceable tissue should be considered. Where distortion is minimal, the use of perforations in the special tray overlying the fibrous region may be all that is required, we have to keep all this point in our mind while recording the impression for flabby ridge. Using the palatal splinting technique it is conceivable that a degree of distortion, although minimal, may occur by anterior distortion during the first stage and compression of the ridge at the second impression stage. The two-stage technique is the closest of the described techniques to recording the fibrous ridge in its undisplaced position and would appear to have the highest number of advocates in the literature reviewed [11, 17-22]. Indeed, the use of mucostatic impression techniques for the majority of normal cases were advised following a review of prosthodontic standards carried out in 1989 [22]. The difficulty in researching this area is not surprising when the multifactorial complexity of denture satisfaction is considered.

### Conclusion

The complete denture should fulfill its basic objectives of stability, retention, support, aesthetics, and preservation of tissues. Flabby ridge gets displaced during conventional impression-making procedures and results in instability of the denture. Treatment options for management of flabby ridge include surgical excision, Implant retained prosthesis, or conventional complete denture. This article presents a review of different impression techniques for managing cases with flabby tissue which are cost-effective, easy, time-saving procedures. This led to better results and better patient compliance

### References

1. Nordenram G. *et al.* Qualitative studies of patients' perceptions of loss of teeth, the edentulous state, and prosthetic rehabilitation: a systematic review with meta-synthesis. *Acta odontologica Scandinavica*. 2013;71:937-951.
2. Peltzer K *et al.* Prevalence of loss of all teeth and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa. *Int J Environ Res and Public Health*. 2004;11:11308-11324.
3. Crawford RW, Walmsley AD. A review of prosthodontics management of fibrous ridges. *Br Dent J*. 2005;199(11):715-19.
4. Kelly E. Changes caused by a mandibular removable partial denture opposing a maxillary complete denture. *J Prosthet Dent*. 2003;90:140-50.
5. Xie Q, Narhi TO, Nevalainen JM, Wolf J, Ainamo A. Oral status and prosthetic factors related to residual ridge resorption in elderly subjects. *Acta Odontologica Scandinavica*. 1997;55:306-13.
6. Yazdanie N, Hobkirk JA. Functional adaptability to changes in lower denture shape. *Eur J Prosthodont Rest Dent*. 1997;5:137-43.
7. Massad JJ. A metal based denture with soft liner to accommodate the severely resorbed mandibular alveolar ridge. *J Prosthet Dent*. 1987;57:707-11.

8. Lynch CD, Allen PF. Management of the flabby ridge: using contemporary materials to solve an old problem. *Br Dent J.* 2006;200:258-61.
9. Grant AA, Johnson W. *Removable denture prosthodontics.* 2nd ed. Edinburgh: Churchill Livingstone. 1992, 61.
10. Basker RM, Davenport JC. *Prosthetic treatment of the edentulous patient.* 4th ed. Oxford Blackwell. 2002, 286-289.
11. Zarb GA, Bolender CL, Carlsson GE. *Boucher's Prosthodontic Treatment for edentulous patients* 11th ed. p 36. London; St. Louis: Mosby. 1997.
12. Carlsson G. Clinical morbidity and sequelae of treatment with complete dentures. *J Prosthet Den.* 1998;79:17-23.
13. Watson RRM, Jemt T, Chai J *et al.* Prosthodontic treatment, patient response, and the need for maintenance of complete implant-supported overdentures: an appraisal of five years of prospective study. *Int J Prosthodont* 1997;10:345-354.
14. Dunnen ACL, Slagter AP, Baat C, Kalk W. Adjustments and complications of mandibular overdentures retained by four implants. A comparison between superstructures with and without cantilever extensions. *Int J Prosthodont.* 1998;11:307-311.
15. Lamb DJ. Problems and solutions in complete denture prosthodontics. pp 57-60. London Quintessence. 1993.
16. McCord JF, Grant AA. *A clinical guide to completedenture prosthodontics.* London: BritishDental Association. 2000, 10-21.
17. Allen PF, McCarthy S. *Complete dentures: fromplanning to problem solving.* LondonQuintessence. 2003, 48-51.
18. Osborne J. Two impression methods for mobilefibrous ridges. *Br Dent J.* 1964;117:392-394.
19. Devlin H. A method for recording an impression for apatient with a fibrous maxillary alveolar ridge. *QuintInt.* 1985;6:395-397.
20. Lamb DJ. Problems and solutions in completedenture prosthodontics. London:Quintessence. 1993, 57-60.
21. Hobkirk JA. *Complete dentures — a dental practitionerhandbook.* Bristol: Wright. 1986, 44-45.
22. *Academy of Denture Prosthodontics: Principles, concepts and practices in prosthodontics.* *J Pros Dent.* 1989;61:88-109.