

A Modified Approach for the Management of Flabby Ridge: A Case Report

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ABSTRACT

Alveolar ridge flaccidity, a common clinical feature, disturbs the mandibular or maxillary ridges. Dentures fixed on these relaxed ridges often experience compromised stability, support and retention necessitating very careful management. This problem predominantly affects the mandibular or maxillary arches alveolar ridges with a heightened predilection to occur in the anterior maxilla. This will lead to movement of mobile denture bearing tissues during masticatory forces causing dislodgement of dentures thus compromising their positioning and peripheral seal integrity. Furthermore, impression making procedures might contribute to tissue distortion in flabby ridges. Specialized impression techniques should be employed for these anatomical defects otherwise they can worsen support, retention, and stability of complete dentures. We present here an article that introduces modified tray technique that is aimed at improving recording of flabby tissues during the process of taking impressions.

Keywords: Flabby ridge, impression techniques, polyvinylsiloxane

INTRODUCTION

Flabby ridges pose significant hurdles in complete denture prosthetic rehabilitation due to their inherent instability and susceptibility to deformation during impression procedures. The consequential compromises in denture fit and function necessitate tailored interventions to mitigate adverse outcomes¹. According to various studies, approximately 5% of edentate mandibles and 24% of edentate maxillae present with flabby ridges^{2,3,4}. When edentulous maxillary ridges are occluded by natural mandibular teeth, particularly in the anterior region, the resultant occlusal forces directed to this area lead to chronic traumatic injury to the maxillary anterior

ridge. This persistent trauma induces significant bone resorption and fibrous hyperplastic tissue formation. Termed "combination syndrome" by E. Kelly, this condition represents a pathological consequence of occlusal discrepancies^{2,5}. Furthermore, the development of flabby ridge conditions is common among long-standing denture wearers due to trauma stemming from poorly fitting denture bases or as a sequela of unanticipated and uncontrolled dental extractions. The lack of robust osseous foundation in flabby ridges undermines denture stability, predisposing them to instability and dislodgment during masticatory and phonetic activities.

Many impression techniques in the literature were described to record flabby ridges with minimum tissue displacement.⁶ A mucostatic impression technique captures the undisturbed denture-bearing areas at rest, aiming for precise adaptation of the resultant denture to the underlying tissues during passive conditions, theoretically enhancing retention. However, it may result in uneven distribution of occlusal forces across the denture-bearing area. Conversely, a mucocompressive impression technique compresses the underlying tissues akin to the anticipated compression by the eventual denture, promoting more uniform distribution of occlusal forces.^{2,7} Despite extensive discourse in dental literature on the optimal impression technique for complete dentures, no definitive evidence exists favouring one method over the other in yielding superior long-term outcomes. In practice, most impression techniques for conventional dentures can be categorized as 'selective pressure' techniques, employing close-fitting custom trays and high viscosity impression materials to compress the soft tissues at the palatal vibrating line while leaving the tightly bound mucosa on the hard palate uncompressed.⁷

Encountering a flabby ridge within an otherwise 'normal' denture-bearing area poses a particular challenge. Conventional impression-making techniques may inadvertently compress the flabby tissue, leading to subsequent recoil and dislodgment of the resulting overlying denture. It becomes evident that an impression technique is necessary that can compress the non-flabby tissues to achieve optimal support while simultaneously avoiding displacement of the flabby tissues.⁸ Numerous impression techniques have been proposed to address the challenge posed by flabby ridges. Liddelow described a method utilizing two separate impression materials in a custom tray, with plaster of Paris employed over the flabby tissues and zinc oxide and eugenol over the 'normal' tissues.⁹ Osborne outlined a technique involving two separate impression trays and materials to

record the 'flabby' and 'normal' tissues separately, which are later related intra-orally.¹⁰ Watson introduced the 'window' impression technique, wherein a custom tray with an opening over the flabby tissues is used. A muco-compressive impression of the normal tissues is first taken, followed by the application of a low viscosity mix of plaster of Paris through the window onto the flabby tissues.¹¹ Watt and McGregor, revisited by Lynch and Allen, described a technique utilizing impression compound on a modified custom tray, manipulated to compress the normal tissues while avoiding displacement of the flabby tissues, followed by a wash impression with zinc oxide and eugenol.¹² However, these techniques are cumbersome and rely on materials such as plaster of Paris, impression compound, and zinc oxide and eugenol, which may not be favored by many general dental practitioners who now prefer newer and easier-to-use materials like polyvinylsiloxanes (silicones), particularly for fixed prosthodontics.

The objective of this paper is to delineate an impression technique specifically designed for obtaining impressions of denture-bearing areas afflicted with flabby ridges. This method involves crafting a modified tray and utilizing contemporary impression material, notably polyvinylsiloxane, rendering it a more accessible and pragmatic solution for dental practitioners in contemporary practice.

MATERIALS & METHODS

A 50-year-old male patient presented to the Department of Prosthodontics at Government Dental College and Hospital, Ahmedabad, with a complaint of wearing an ill-fitting denture for the past year. On intra-oral examination, the patient exhibited an edentulous maxillary arch with a markedly displaceable anterior flabby ridge and dentate mandibular arch with full set of teeth present.

After thorough discussion with the patient regarding the available treatment modalities, it became evident that the patient was

apprehensive about undergoing surgical procedures such as dental implants. Consequently, it was agreed upon to proceed with the provision of a new maxillary complete denture, focusing on meticulous attention to the impression technique and the thoughtful design of the occlusal scheme.



Fig. 1 Pre-op photograph

A primary impression of the maxillary denture bearing area was made with a low viscosity irreversible hydrocolloid material ('Alginate'; DPI), to ensure minimal distortion of the displaceable ('flabby') tissues.

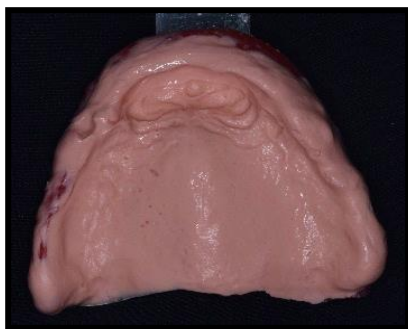


Fig. 2 Primary impression of the flabby arch

The impression was poured in dental stone (Type III, Kulzer). The displaceable areas were identified on the cast and marked with indelible pencil.



Fig. 3 Special tray for fabricated for final impression

An orthodontic band was encircled around the anterior flabby area to provide support for the tray, and a custom-made close-fitting special tray was constructed using cold-cured acrylic resin. Notably, the tray design incorporated a specific feature whereby the flabby area remained uncovered, effectively creating a window in the tray.

The tray was tried in the patient mouth and the flanges were adjusted to be 2 mm shorter than the depth of sulcus using a slow-speed motor and carbide acrylic-trimming bur.

An appropriate border correction was done by green stick compound material and a wash impression was made over it by zinc oxide eugenol paste. An impression of the displaceable mucosa was then recorded by applying a light body silicone impression material. On removal of the tray peripheral seal was established. This technique minimized the pressure on the unsupported, displaceable soft tissue during the impression making process. The excess material was extruded, and the fibrous ridge was allowed to assume a resting position with minimal pressure exerted upon it.



Fig. 4 Border molding and flabby area recording



Fig. 5 Final impression

The master cast was prepared followed by facebow recording was done for jaw relation record. Teeth setting was done on Hanau wide veu articulator in bilateral balanced occlusion and conventional complete denture was delivered to the patient.



Fig. 6 Teeth setting



Fig. 7 Post-op photograph

DISCUSSION

The demographic profile of individuals seeking complete dentures or replacements has notably aged over the past three decades.¹³ Due to advancements in dental techniques and treatment philosophies, an

increasing number of patients are able to maintain a portion, if not all, of their natural teeth well into their later years.¹⁴ Occasionally, atypical configurations of remaining natural teeth can lead to unfavorable distribution of biting forces on the remaining alveolar ridges. This can result in bone loss and the formation of flabby tissues. Additionally, elderly patients may have medical conditions or undergo medical treatments that make them unsuitable candidates for surgical procedures like ridge removal, bone grafting, or dental implant placement. Therefore, the introduction of this new impression technique is particularly relevant. It outlines a method to address inadequate denture-bearing areas by building upon fundamental principles of complete denture construction, without the need for invasive surgical interventions.

Patients often report a loose denture crafted for flabby ridges when proper precautions to prevent compression of the flabby tissues are overlooked. A typical remedy for addressing this issue is the application of chairside reline material to the denture.⁸ It is important to recognize that applying chairside reline material to address a loose complete denture on a flabby ridge is an ineffective solution. In this scenario, the complete denture essentially acts as a custom tray, and the viscous chairside reline material further displaces the flabby tissue. Consequently, the tissues may recoil, and the denture will continue to feel loose.

The described technique offers the advantage of not requiring additional clinical stages during the construction of a complete denture, thereby minimizing clinical time. This impression technique can be performed relatively quickly and utilizes materials with which general dental practitioners are already familiar. There is no need for practitioners to use unfamiliar materials, reducing apprehension. Polyvinylsiloxanes, the materials utilized, are dimensionally stable and do not require immediate pouring. Moreover, they are less

brittle than "plaster of Paris" and do not necessitate delicate handling.⁸

Two additional points worth noting from the described technique are as follows:

Firstly, after completing the master impression, it is crucial to ensure proper orientation of the occlusal plane and achieve a suitable occlusal scheme with balanced contacts during excursive movements. Utilizing a face-bow transfer and arranging teeth on a semi-adjustable articulator can facilitate this process. Incorrect orientation of the occlusal plane or the inclusion of displacing occlusal contacts can further destabilize a denture relying on poor-quality denture-bearing tissues, rendering efforts to secure an adequate impression futile. Secondly, the use of a transparent acrylic heat-cured base allows for rapid assessment of the accuracy of the impression technique. This transparency enables quick visualization of the adaptation of the base to the underlying denture-bearing areas. Any air ingress can be promptly identified, and movement of the base can be observed in conjunction with specific movements, providing valuable feedback on the impression quality.¹⁵

CONCLUSION

The management of esthetic, social, and functional concerns in completely edentulous patients adheres to the principles of the minimally displacive technique. Achieving stable and retentive dental prostheses is particularly challenging when dealing with fibrous ridges. The approach to fibrous tissue management has shifted away from surgical removal, recognizing that implant-retained prostheses are not suitable for all patients. In conventional prosthodontics, various impression techniques are employed to address issues arising from unsupported tissue during denture construction. However, current scientific evidence does not conclusively favor one technique over another. When selecting an impression technique, factors such as the location and extent of the unsupported tissue and the patient's specific

concerns must be considered. The treatment described optimizes the selective pressure technique by simplifying modifications to the original concept.

Declaration by Authors

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