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Impression Techniques for Flappy Tissue

A PROJECT
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in Partial Fulfillment for the Degree of
Bachelor of Dental Surgery (B.D.S.)

By:

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B.D.S., M.Sc. in Prosthodontics

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DECLARATION

I certify that this project entitled " Impression Techniques for Flappy Tissue" was prepared by the fifth-year student **Bassam Alaa Abd Al-Hussain** under my supervision at the College of Dentistry/University of Baghdad in partial fulfilment of the graduation requirements for the Bachelor Degree in Dentistry.

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/ /2022

DEDICATION

To my lovely **mother** & **father**, for their patience, support & being the N^0. 1 believers in me.

To my **late grandfather** the man who I have always aspired to be.

To all people who supported and encouraged me; family, friends, teachers and Colleagues, Many thanks to all of you.

Bassam Alaa

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LIST OF CONTENTS

LIST OF FIGURES

INTRODUCTION

The performance of a complete denture is often a reflection of its support and retention. A master impression for a complete denture should 'record the entire functional denture-bearing area to ensure maximum support, retention and stability for the denture during use. However, difficulties arise when the quality of the denture bearing areas are not suitable for this purpose (Lynch and Allen 2006).

Displaceable, or 'flabby ridges', occurs by replacing bone with connective fibrous tissue. It is most often found in the anterior part of the jaw, especially when there are remaining anterior mandible teeth or when associated with removaable partial dentures in case of edentulous spaces representing a consequence of ridge overload and occlusal imbalances (Cristalli *et al.*, 2020).

In general, impression making is the most basic and important requirement for a functionally and esthetically successful denture. Forces exerted during impression making can result in distortion of the mobile tissue and the resulting denture will be highly compromised in function and appearance (Lynch and Allen 2003).

The methods to overcome this problem are either by the surgical removal of the fibrous ridge or modification of impression techniques. The removal of fibrous ridge surgically will leave a firm ridge but will reduce the stability of the denture as well as lead to elimination of vestibular area. These problems can be solved to some extent by fabricating a denture over a flabby ridge using impression technique specific for this condition (Sajani and Ranukumari, 2012).

Published studies indicate that the prevalence of flabby ridges can vary, occurring in up to 24% of edentate maxillae and in 5% of edentate mandibles (Labban, 2018).

Therefore, from a clinical perspective, fabrication of a retentive maxillary or mandibular denture for patients with fibrous ridge can be extremely challenging. Modified impression techniques are required to record the fibrous tissues in undistorted form and thus help to fabricate a stable and functionally satisfying denture. Hence, there are various impression techniques were invented so that they could be used in flabby ridge patients (Sajani and Ranukumari, 2012).

AIMS OF THE REVIEW

- To describe and understand the various techniques of impression technique for flabby ridges that makes use of different impression materials routinely available in general dental practice.
- Appreciate the challenges presented by a flabby ridge when constructing complete dentures.
- To identify etiological factors of the flabby ridge condition in the edentulous patients.

CHAPTER ONE

REVIEW OF LITERATURE

1.1 Flabby Ridge

Flabby ridge, by definition, is a fibrous ridge or a superficial area of mobile soft tissue affecting the maxillary or mandibular alveolar ridges. It can develop when hyperplastic soft tissue replaces the alveolar bone and is a common finding, particularly in the upper anterior region of long- term denture wearers. Masticatory forces can displace this mobile denture-bearing tissue, leading to altered denture positioning and loss of peripheral seal. Forces exerted during the act of impression making can result in distortion of the mobile tissue. Unless managed appropriately by special impression techniques, such ‘flabby ridges’ adversely affect the support, retention and stability of complete dentures (Bansal *et al.,* 2014).

Ideally, the masticatory mucosa overlying the residual ridges must be neither too thin or too thick, the ideal average thickness being about 1.5 to 2 mm. Excessively thin mucosa is easily pinched between the denture and the underlying bone. Excessively thick mucosa undergoes extensive movement and deformation during fabrication and use of a complete denture (Munakata *et al*., 2021).

1.2 Combination Syndrome

The Progressive resorption of residual alveolar ridge is one of the well documented consequence of tooth loss. For many years, the focus of attention was mainly on problems associated with resorbed mandibular alveolar ridges and the influence of this on denture retention and stability. A more recently documented phenomenon has been the edentulous 'flabby' maxillary ridge. Watson discussed this phenomenon in 1970, and described an impression technique for maxillary fibrous ridges (Xie *et al.,* 1997). Further discussion was reported by Kelly in 1972, when he described changes caused by a mandibular removable partial denture opposing a maxillary complete denture. He suggested the term 'combination syndrome' to describe the clinical features, including loss

of bone from the anterior maxilla with concurrent fibrous tissue hyperplasia; overgrowth of the maxillary tuberosities; extrusion of the anterior mandibular natural dentition and papillary hyperplasia of the hard palate (Kelly, 1972; Kirti, 2021).

According to this premise, "**combination syndrome**" was defined as "*the characteristic features that occur when an edentulous maxillae is opposed by natural mandibular anterior teeth and a mandibular bilateral extension-base removable partial denture, including loss of bone from the anterior portion of the maxillary ridge, hyperplasia of the tuberosities, papillary hyperplasia of the hard palate's mucosa, supra-eruption of the mandibular anterior teeth, and loss of alveolar bone and ridge height beneath the mandibular removable partial denture bases*" (Len, 2007).

Kelly in 1972, described five signs that commonly occurred in this situation. They include:

1. Loss of bone from anterior part of maxillary ridge.
2. Overgrowth of tuberosities.
3. Papillary hyperplasia in the hard palate.
4. Extrusion of lower anterior teeth.
5. Loss of bone under partial denture base.

Six additional changes or signs associated with this syndrome were added later They include:

1. Loss of vertical dimension of occlusion.
2. Occlusal plane discrepancy.
3. Anterior spatial repositioning of mandible.
4. Poor adaptation of prosthesis.
5. Epulis fissuratum.
6. Periodontal changes.

(Jitendra *et al.*, 2016).

In typical CS cases, a maxillary ridge is completely edentulous (fig. 1). However, patients with a partial maxillary edentulism can also have similar signs and symptoms. Cases of maxillary RPD with an anterior edentulous space and preserved posterior teeth opposed by mandibular anterior teeth and a distal extension RPD or natural mandibular dentition demonstrate analogous deteriorating effects of CS (Tolstunov, 2007).

On the contrary, A review of the literature found on epidemiological studies of combination syndrome. Findings such as hyperplasia of the hard palatal mucosa seem rare compared to bone loss in the anterior portion of the edentulous maxilla, which is the main symptom of combination syndrome (Palmqvist and Gunnar, 2003).

Fig. 1: Typical case of the combination syndrome patient with a complete edentulous maxilla opposed by the anterior mandibular teeth and a distal-extension removable partial denture (Tolstunov, 2007)

Enlarged tuberosities may have other causes than those described by Kelly as part of combination syndrome. Enlarged tuberosities are often seen together with supra erupted maxillary molars. In situations where mandibular molars have been lost, the opposing maxillary molars may supra erupt as part of the alveolar process resulting in enlarged tuberosities that are unrelated to denture use (Palmqvist and Gunnar, 2003).

To sum up, the lack of epidemiological studies and the rare occurrence of combination syndrome in the population have prevented it from achieving full acceptance as ‘a medical syndrome’.

1.3 Etiology of Flabby Tissue

The direct mechanism of bone resorption and tissue atrophy in the mouth is still not fully understood. Many factors have been suggested as contributing to both the initiation and modification of this process (Ronald *et al.,* 1974).

Historically, flabby ridges found in the anterior maxilla were a feature of the 'combination syndrome' (Lynch and Allen 2004) In this 'condition', the flabby ridge was thought to occur as a result of a maxillary complete denture opposing mandibular anterior natural teeth, without proper posterior occlusal support. Such flabby tissues could also arise as a result of unplanned or uncontrolled dental extractions. (Allen and McCarthy 2003)

Although the etiology of flabby tissue cannot be defined specifically, most of the known causes are:

1. Chronic irritation, this could be from ill-fitting dentures, occlusal disharmony and traumatic denture fitting surface.
2. Load concentration on the anterior segment of the ridge. Such as Anterior masticatory habits or anterior interference causes load concentration on the anterior segment of the ridge also dentures constructed with anterior porcelain teeth and posterior resin teeth.
3. Rapid ridge resorption on the lingual and labial on the lower alveolar ridge frequently results in a narrow knife-edge ridge.
4. Combination Syndrome Complete maxillary denture opposing natural mandibular anterior teeth.
5. Not removing the dentures during night time to allow oral mucosa to regain its resting form
6. Anterior over-erupted natural teeth against edentulous ridge.

(Lynch and Allen, 2006).

Because of the unanswered questions about the initiation and continuation of both atrophy and resorption of alveolar bone, it is not possible to explain adequately the development of the hypermobile ridge crest. There are probably many physiologic and clinical factors that act simultaneously in producing this condition.

1.4 Clinical Examination

The initial consultation should involve a thorough examination of the alveolar ridge and overlying soft tissue anatomy.

The flabby ridge can be determined by using a ball burnisher which blanches the tissue when pressure is applied (Fig. 2). A thorough examination of the edentulous area along with a detailed denture history and psychological assessment of the patient plays an important role in the success of any prosthesis (Agarwal *et al.*, 2011).

Ideally, the patient presents with a well-rounded ridge that is adequate both in height and width. Additionally, any abnormalities in the mucosal architecture must be noted (Fig. 3). Practitioners must therefore pay particular attention to patients presenting with an edentulous anterior aspect of maxilla opposing preserved mandibular anterior teeth. However, there are some reports of posteriorly located flabby ridges. Flabby ridge may give rise to complaints of pain or looseness relating to a complete denture that rests on them (Fig. 3) (Bansal *et al.*, 2014).

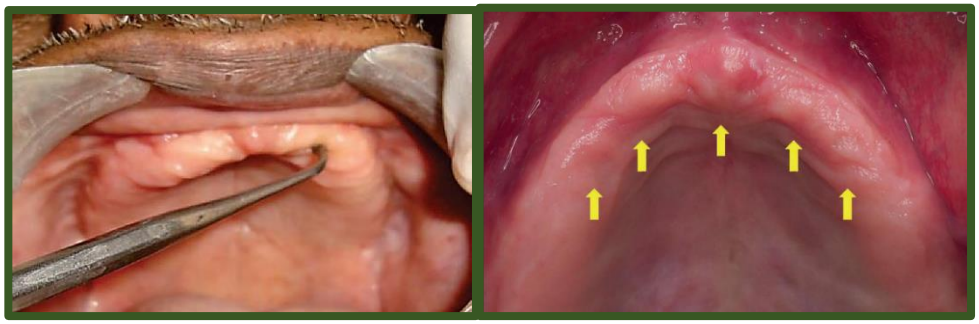

Fig. 2: Flabby ridge blanches when pressure is applied (Agarwal *et al.*, 2011)

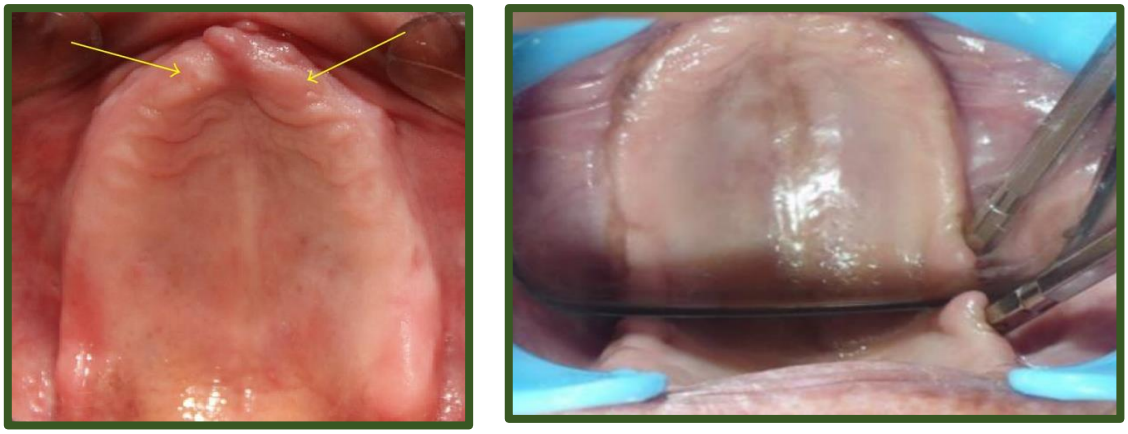

Fig. 3: A. edentulous maxillary arch with arrows showing areas of flabby tissue. B. Flabby tissue in the maxillary posterior region. (Pai *et al.*, 2014).

1.5 Management of Flappy Tissue

The real problems arise when making new dentures, if the flabby ridge is not properly treated therapeutically. There are several ways in which such a situation can be resolved. The first one is the surgical removal of connective tissue, but with a greatly reduced bone ridge as a result. From a prosthetic point of view, the difference will have to be compensated by the base of dentures, implying its thickening and the simultaneous increase in weight and volume. Another therapeutic possibility is implant-prosthetic treatment that requires augmentation, implant insertion and overdentures (Cristalli *et al.*, 2020).

If the flabby ridge is preserved, a viable therapeutic solution for the success of the mobile treatment is represented by the special impression techniques of the prosthetic field. When the impression is a conventional one, there will always be a degree of compression of the tissues, the natural position of the soft tissues being altered (Kulkarni *et al.*, 2018).

The three main approaches to the management of the flabby ridge are:

1. Surgical removal of fibrous tissue prior to conventional prosthodontics.

2. Implant retained prosthesis.
3. Conventional prosthodontics without surgical intervention.

Each technique of the above has its advantages and shortcomings. (Crawford and Walmsley, 2005).

1.5.1 surgical approach

A poor ridge is better than no ridge, which could be a sequel to surgical excision of the flabby tissues The advantage of the surgical technique is that it provides a firm denture bearing area. which enhances the stability of the prosthesis. Its limitations include chances of decrease in vestibular height requiring an additional surgery of vestibuloplasty. It is contraindicated in patients who are unwilling to undergo a surgical treatment (Pai *et al.,* 2014).

Also, removal is contraindicated in circumstances where little or no alveolar bone remains. It can be argued however that the fibrous part of the ridge has a cushioning effect which reduces trauma to the underlying bone, which therefore should not be removed. (Crawford and Walmsley, 2005).

as with any surgical treatment option, the health of the patient must be taken into consideration. Patients presenting with this particular prosthodontic problem are often elderly and may have a complicating medical history. If the medical history, review of systems, and examination reveal no contraindications to surgery, the surgeon may then consider a variety of preprosthetic procedures (Hupp *et al.,* 2014).

Before the excision of the unsupported hypermobile tissue, a determination must be made whether the underlying bone should be augmented with a graft. If a bony deficiency is the primary cause of soft tissue excess, then augmentation of the resorbed bony ridge with Hydroxyl-apatite or piece of bone from ribs and hip is the treatment of choice. If adequate alveolar bone height remains after the

reduction of the hypermobile soft tissue, then excision may be indicated (fig. 4) (Chiapasco *et al.*, 2007; Zakhary *et al.*, 2012).

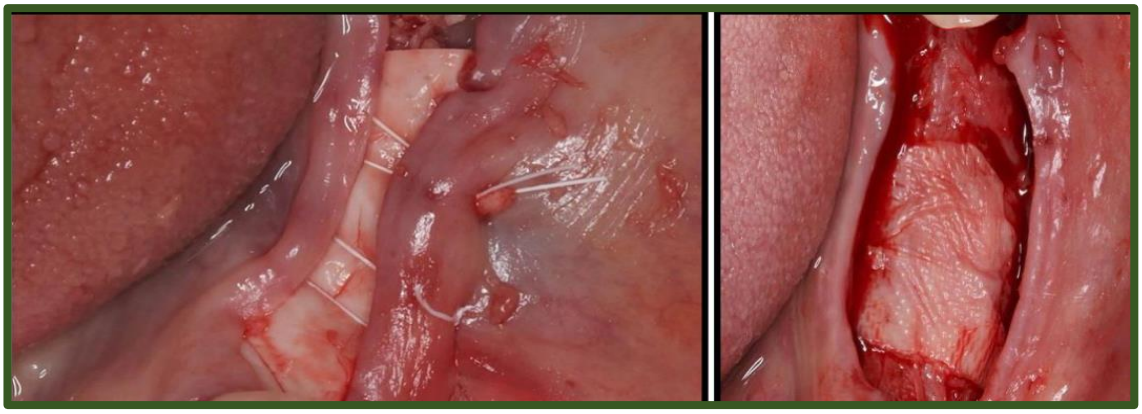

Fig. 4: Ridge augmentation and collagen membrane (Cucchi *et al.*, 2020).

Fig. 5: (A) Flabby tissue in edentulous lower ridge of 64 years old patient. (B) administration of the L.A. (C) Surgical excision (D) Suturing the wound. (Oral and Maxillofacial Department – Baghdad Dental Teaching Hospital, 2021)

1.5.2 Implant Retained Prostheses

Implant prosthesis take the support from the underlying bone hence minimal or no support is needed from the tissue area. In terms of patient economics and time taken for the completion of procedure, the implant supported prosthesis has its drawbacks. Other factors that must be considered include surgery, discomfort and inconvenience, general health of the patient, and risk of surgical complications or implant failure (Xie *et al.*, 1997).

Fixed and removable implant retained prostheses offer potential benefits to many of the problems encountered with conventional prosthodontics. These may be an attractive alternative due to the enhanced 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 as usually fewer implants are required. However, the recurrent cost due to maintenance can be considerable (Watson *et al.*, 2001)

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%. It is thought that this could be due to the placement of shorter implants into highly vascular, poor volume, low-density bone. The diminished alveolar bone volume in this subject group may result in restrictions on suitable implant sites or the need for bone augmentation (Goodacre *et al.*, 1999)

1.5.3 Conventional Prosthetic Management

A particular problem is encountered in the conventional impression making if a flabby ridge is present within an otherwise “normal” denture bearing area. If the flabby tissue is compressed during conventional impression making it will later tend to recoil and dislodge the overlying denture. Thus, over the years,

several impression techniques have been suggested for the impression of a flabby tissue ridge which will support the flabby tissue but at the same time will not displace it (Pai *et al.*, 2014).

There are two impression principles which are reported to overcome this problem:

1. **The mucostatic technique** (non-displacive).
2. **The mucocompressive technique** (displacive).

And a combination of both is used in certain situations, which is called the selective pressure impression technique, where some denture bearing tissues are displaced, and others are not. (Lynch *et al*., 2006).

Mucostatic impression technique, which aims to achieve support from the other firm areas of the arch and maximizes retention. the mucostatic impression technique records the un-displaced denture bearing areas at rest. As the resultant denture is more closely adapted to the underlying tissues at rest, it is theoretically more retentive. However, occlusal forces will not be evenly distributed across the underlying denture bearing area (Kirti, 2021).

In contrast, Mucodisplacive (mucocompressive) impression technique, with the aim of compressing the loose flabby tissue to allow functional support from it by replicating the contour of the ridge during compression by occlusal forces. In this fashion, the resultant occlusal forces will be more evenly distributed across the denture bearing tissues. At present, the published evidence does not clearly support the superiority of either of these techniques over the other. The following techniques have been described (Crawford and Walmsley, 2005).

Prosthodontic literature has documented various impression techniques for overcoming the problem of the flabby ridge. Osborne described a technique

whereby two separate impression trays and materials are used to separately record the 'flabby' and 'normal' tissues, and then related intra-orally (Osborne, 1964).

Liddlelow described a technique whereby two separate impression materials are used in a custom tray (using 'plaster of Paris' over the flabby tissues, and zinc oxide and eugenol over the 'normal' tissues) (Liddelow, 1964).

Watson described the 'window' impression technique where a custom tray is made with a window or opening over the (usually anterior) flabby tissues. A mucocompressive impression is first made of the normal tissues using the custom tray and zinc oxide and eugenol. Once set, it is removed, trimmed, and re-seated in the mouth. A low viscosity mix of 'plaster of Paris' is then painted onto the flabby tissues through the window. Once set, the entire impression is removed. Each of these techniques might be considered cumbersome, and the difficulties associated with their manipulation could lead to inaccuracies (Watson, 1970).

Watt and McGregor described a technique where 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. While this final impression technique is clearly less complex that the previous three described, the problem with all four techniques is that they rely on materials such as 'plaster of Paris', impression compound, and zinc-oxide and eugenol. Many general dental practitioners now rely on 'newer', more 'easy-to-use' materials, such as polyvinylsiloxanes (silicones), particularly for fixed prosthodontics (Watt and MacGregor, 1986; Lynch and Allen, 2005).

Many newer materials, such as polyvinylsiloxanes, are currently available with varying consistencies and dispensing methods to suit the dental practitioner. While there is much speculation in the dental literature regarding the most

suitable impression technique for a complete denture, there is no evidence to indicate that one technique produces better long-term results than the other (McCord and Grant 2000).

1.6 Impression Techniques

1.6.1 **Window Impression Technique** (minimally displacive impression technique)

In window impression technique, A preliminary impression of the maxillary edentulous arch is made using an irreversible hydrocolloid impression material and was poured in dental plaster to obtain a primary cast. Extension of flabby area was marked with the help of marking pencil on the maxillary primary cast. After that, proper wax spacer (Modeling Wax) was adapted such that there were four tissue-stops to stabilize the tray in maxillary arch. Over it, a special tray was fabricated using auto-polymerizing acrylic resin (DPI cold cure) and the borders were reduced to 2 mm short of the sulcus. Border moulding was performed with the help of low-fusing impression compound (DPI Pinnacle). Window was prepared in the custom tray in the area of flabby tissue (Fig. 6). This was done using round and fissured bur. After this, the spacer was removed and the definitive impression was made in zinc oxide eugenol impression paste. The excess material over the window cut off with sharp scalpel blade and the flabby area was recorded using an impression plaster (Fig. 8, 9). Impression plaster was applied with a painting brush in proper consistency so that it wouldn't run out of the area. The impression plaster should be stiff enough to be applied with a brush. Apply a separating medium over the plaster part of the impression before pouring it. If elastomeric impression material is available, then tray adhesive can be applied on the borders and on the tissue surface of the tray. Allow the tray adhesive to dry for 10 minutes before loading the tray with elastomeric material to obtain a chemical bond between the tray and the material. The definitive

impression can be made with monophase polyvinyl siloxane impression material (Reprosil) and the excess over the window opening can be trimmed away with sharp scalpel blade (Fig. 10). The flabby area can be recorded with light body polyvinyl siloxane (Reprosil). This can be injected with syringe on to the flabby area exposed through the window made in the special tray (Fig. 11). In both the conditions, place the impression plaster/light body elastomeric material in such manner so that it will prevent the distortion of the soft hypermobile tissue. After adequate disinfection of the impressions and beading/boxing procedures, impression can be poured in type III dental stone to obtain the master cast (Suryaakant and Pushkar, 2017).

In this technique the flabby ridge is recorded in minimally displaced form and rest of the tissue in functional form. This technique was first discussed by Osborne in 1964 (Sajani and Ranukumari, 2012).

Fig. 6&7: Border molding done on a special tray with a window at the flappy area, Impression plaster is applied on the flabby ridge exposed through the window (Sajani and Ranukumari, 2012).

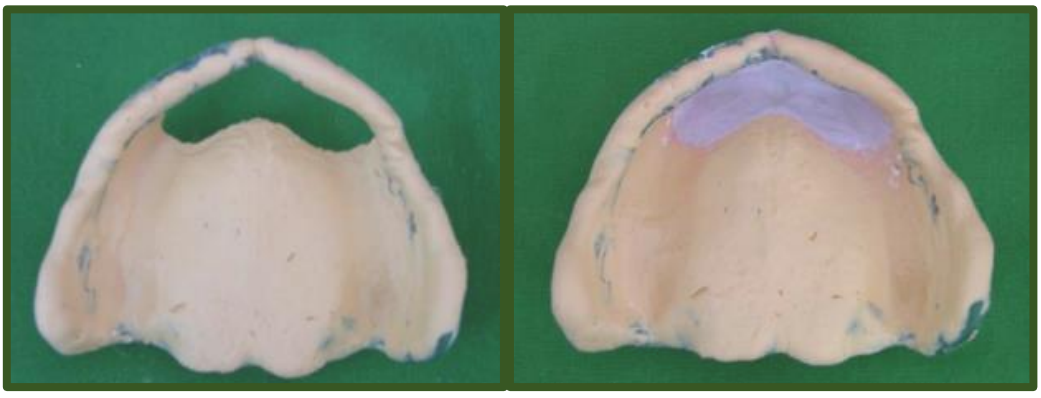

Fig. 8&9: Definitive impression made with zinc oxide eugenol impression paste. Completed definitive impression with flabby area recorded in impression plaster (Suryaakant and Pushkar, 2017).

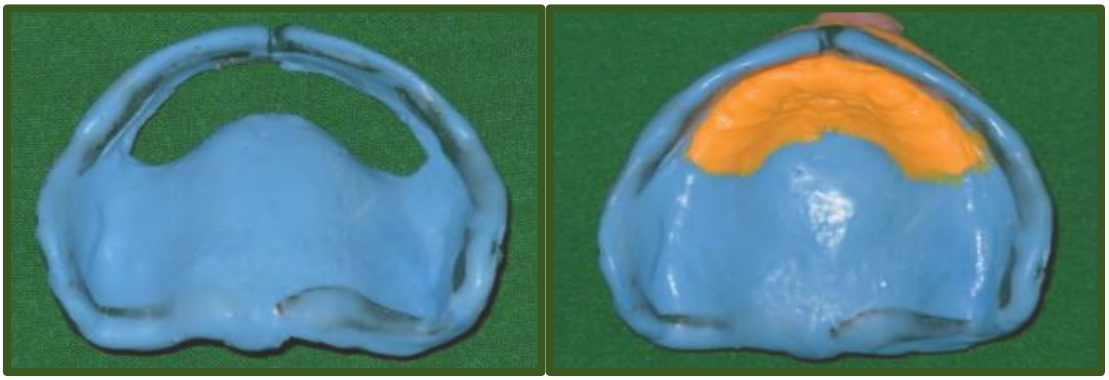

Fig. 10, 11: Definitive impression made with polyvinyl siloxane elastomeric impression material. Completed definitive impression with flabby area recorded in light viscosity elastomeric impression material (Suryaakant and Pushkar, 2017).

1.6.2 **The Selective Pressure Impression Technique** with Relief Areas And Pinholes

A particular problem is encountered in the conventional impression making if a flabby ridge is present within an otherwise "normal" denture bearing area (Allen et al., 2003).

In this technique, A primary impression of the upper and lower arches were taken with alginate and poured with dental stone and the displaceable tissues were identified on the cast. The stress bearing areas in the maxillary denture were relieved with modeling wax ("I" shaped spacer was applied along the mid palatine raphe) and additional relief was done on the anterior flabby tissue region from canine to canine (Pai et al., 2014).

The mandibular cast was first adapted with a layer of wax to provide extra relief in the flabby region followed by addition of one more layer of wax covering the ridge except the buccal shelf area. Then, the custom tray was fabricated using clear autopolymerizing acrylic resin covering the tissues except the area that was flabby. Over the "open" area of the tray another "supporting tray" of clear acrylic was made thus covering the flabby ridge (Pai et al., 2014).

For the final impression of the lower ridge; the buccal shelf area was recorded by using mucocompressive impression material like impression compound which in this case is the primary stress bearing area and it also acts as a stopper for the tray in the final impression procedure. The remaining borders of impression were recorded by selective pressure technique using green stick compound (Pai et al., 2014).

Finally, the spacer wax was then removed and multiple holes were drilled in the region of the flabby tissue. Tray adhesive was applied. A final impression with monophase (medium Body addition addition silicone was made (Pai et al., 2014).

Full technique steps Illustrated in Figures below:

Fig. 12: Edentulous mandibular arch showing areas of flabby tissue. (Hosi *et al.*, 2014)

Fig. 13: (Left) Relief wax placed over the mandibular flabby ridge region. (Right) Mandibular custom tray fabricated with clear acrylic resin. (Hosi *et al.*, 2014)

Fig. 14: (Left) Custom tray with complete mandibular border moulding. (Right) Completed mandibular impression with monophase polyvinylsiloxane material. (Hosi *et al.*, 2014)

Final Impression of the Upper Ridge: The maxillary borders were recorded by selective pressure impression technique using green stick compound. Placement of multiple relief holes was done to ensure prevention of pressure buildup in the flabby area thereby leading to inadvertent tissue compression. Tray adhesive was applied. Similar to the lower impression a monophase impression of addition silicone was made (Pai *et al.*, 2014).

Full technique steps Illustrated in Figures below:

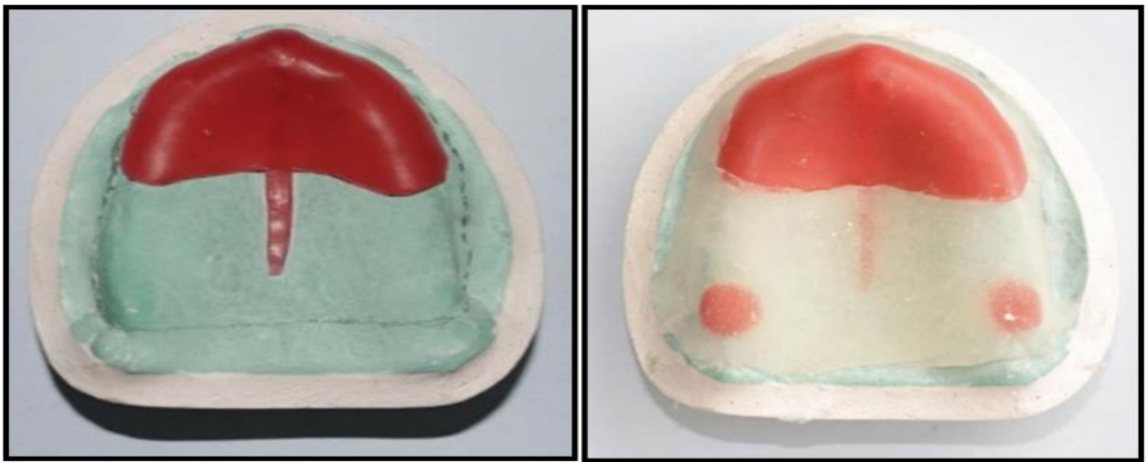

Fig. 15: (Left) Relief wax placed over the maxillary arch. (Right) Clear acrylic custom "open" tray. (Hosi et al., 2014)

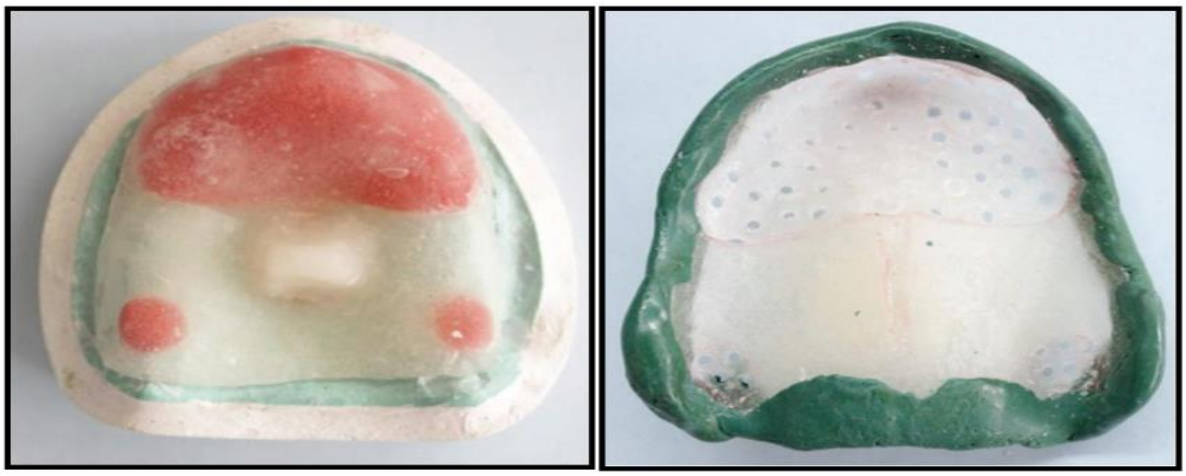

Fig. 16: (Left) Maxillary custom tray with "supporting" tray covering areas of flabby tissue with the handle placed at the center of the palatal area. (Right) Maxillary custom tray with multiple relief holes. (Hosi et al., 2014)

Fig. 17: (Left) Completed secondary impression with monophase PVS material. (Right) Fabricated prosthesis. (Hosi et al., 2014)

1.6.3 Selective Perforation Tray Technique

It has been suggested that if the degree of mucosal displacement is minimal, then this modified conventional technique may be considered. (Crawford and Walmsley, 2005).

Preliminary impressions are taken in stock trays using low-viscosity alginate after appropriate border correction. 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. Pressure on the unsupported, displaceable soft tissue can be minimised further by the use of perforations in the tray overlying these areas (Figs. 18,19,20). Undisplaced mandibular ridge Displaced mandibular ridge Selective perforation special tray (Crawford and Walmsley, 2005).

Figs. 18,19: Undisplaced mandibular ridge (left). Displaced mandibular ridge (right). (Crawford and Walmsley, 2005).
Figs. 20: Selective perforation special tray (Crawford and Walmsley, 2005).

1.6.4 The modified open window technique with PVS:

The literature describes a number of impression techniques for managing flabby tissue; however, their objective to record the displaceable tissue 'at rest' remains consistent. Techniques such as the window technique, the use of multiple relief holes, or recording the compressible and displaceable tissue using two

separate impression materials and trays, can lead to inaccuracies (Lynch *et al.*, 2006). On the other hand, modern PVS impression materials are now

available in multiple viscosities and handling properties, offering a solution to the difficulties associated with traditional impression techniques (Fokkinga *et al.*, 2017).

This technique involves the greater use of the mobile anterior tissue for denture support. Having made the primary impression, as described previously, a model is cast in dental stone. light-body PVS is used to record the flabby tissue, alongside a muco-compressive record of the 'normal' tissue with ZOE, and functional record of the sulcus, tuberosities and post-dam with impression compound (Fig. 21). Authors argue that this technique is preferable to the

minimally displacive one as it reduces movement of the denture base over the support tissue during occlusal function. However, there is no evidence to support this claim and the clinician must be comfortable with the impression material and produce consistent results (Devan et al., 2005). Subsequently, clear acrylic resin bases (Fig. 22) can be used

to accurately assess uniformity of pressure distribution over the fibrous tissue, minimizing the risk of displacement. The wax rims can be subsequently moulded onto the acrylic resin base to prescribe the desired vertical and horizontal dimension (Lynch et al., 2006).

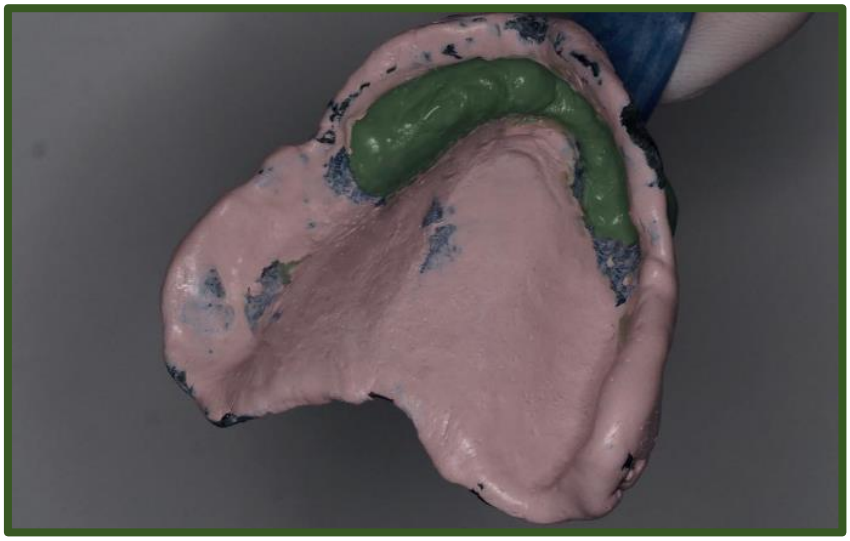

Fig. 21: Maxillary modified window technique impression with lightbody PVS (light green), ZOE (pink) and impression compound (peripheral border) (Imran , 2018)

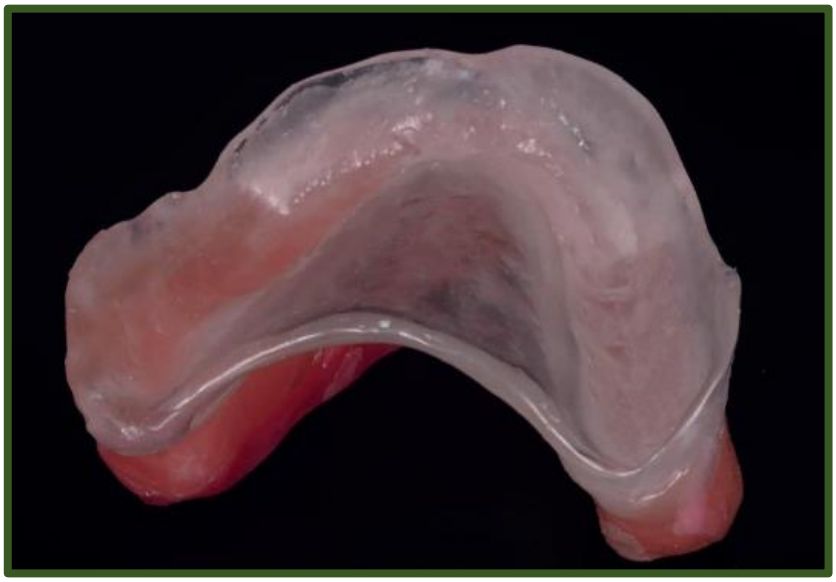

Fig. 22: Maxillary wax registration block with clear acrylic resin base (Imran , 2018)

1.6.5 Zafrulla and Hobkrik Combination Impression Technique

Watson described the 'window' impression technique with plaster and zinc oxide eugenol (Xie *et al.*, 1997), Zafrulla and Hobkrik modified the technique where a custom tray is made with a window or opening over the (usually anterior) flabby tissues (Finbarr 2005).

A **muco-compressive** impression is first made of the normal tissues using the custom tray and zinc oxide and eugenol. Once set, it is removed, trimmed, and re-seated in the mouth. A light body elastomeric impression is then used in the flabby tissues through the window. Once set, the entire impression is removed. Each of these techniques might be considered cumbersome, and the difficulties associated with their manipulation could lead to inaccuracies. (Kirti, 2021).

Fig. 23: (a. intra- oral photograph b. opg of patient). It was noted that there was an extensive area of flabby tissue present on the anterior region of her maxillary denture bearing area. (Finbarr 2005).

A primary impression of upper edentulous arch was made with a low viscosity irreversible hydrocolloid material (Alginate) to ensure minimal distortion of the displaceable ('flabby') tissues. The impression was poured in dental stone. Two uniform thicknesses of dental wax were placed as a spacer. The custom tray was fabricated in the usual manner (Finbarr 2005).

Fig. 24: Customized impression tray for final Impression (Finbarr 2005).

At the chair-side, the custom tray was inserted into the mouth and any over-extended areas of the periphery were reduced. The master impression was then made as follows: Border molding is done in regular manner with green stick and then impression was made with zinc oxide eugenol impression material.

Fig. 25: Border moulding with zinc oxide wash impression (Finbarr 2005).

Using a scalpel, any material that had flowed into the area of the tray associated with 'flabby' tissues was removed. The flabby region was marked intraorally with an indelible pencil. The custom tray was perforated over the areas of the primary cast representing the flabby tissues. The area of the custom tray associated with the 'flabby' tissues was then filled with light bodied polyvinylsiloxane impression material. (Finbarr 2005).

Fig. 26: A. removal of material from flabbly ridge area and perforation were made B. light body Impression was made (Finbarr 2005).

Once set, the impression was removed from the mouth and inspected. Any excess material was removed.

The impression was poured in dental stone, paying careful attention to preserving the bordered moulding of sulcus area. Denture fabrication then continued in the usual manner. The dentures were inserted, and at subsequent follow-up appointments patient reported satisfactory stability, aesthetics and function (Lynch and Allen, 2006)

CHAPTER TWO

CONCLUSIONS

2.1 CONCLUSIONS

Fibrous ridges pose a prosthodontic challenge for the achievement of stable and retentive dental prostheses. Emphasis has moved away from surgical removal of the fibrous tissue. Implant retained prostheses may not be most suitable treatment option for many patients.

When considering conventional prosthodontics, there are a variety of impression techniques available to address the problems caused by the unsupported tissue during denture construction. the choice of treatment type ultimately depends on the patient, the amount of time and money he is willing to spend for the treatment, and his oral condition and his desire for fixed or removable prosthesis.

Normal mucocompressive technique are likely to record the flabby tissue in distorted state which will lead to loss of stability and retention of prosthesis. While 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. All these limitations can be succeeded by the use of selective pressure or minimally displacive impression techniques.

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