WINDOW IMPRESSION TECHNIQUE FOR FABRICATION OF FULL DENTURES IN PATIENT WITH FLABBY TISSUE

(TEKNIK PENCETAKAN WINDOW PADA PEMBUATAN GIGI TIRUAN LENGKAP PADA PASIEN DENGAN JARINGAN FLABBY)

Irham M. Adinugraha[1*], Azkya Patria Nawawi[1], Sam Widi Firmansyah[2]

[1]Department of Prosthodontic, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi Indonesia
[2]Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi Indonesia

*Corresponding author
irhamadinugraha@fkg.unjani.ac.id

JHDS.unjani.ac.id/jite
Doi: 10.54052/jhds.

Article History
Received:26/06/2024
Accepted: 03/07/2024

ABSTRACT

Fabrication of completely edentulous patients with flabby tissue can lead to difficulty in making the impression due to the differences in compressibility of the flabby tissue and the other soft tissue. The flabby tissue can be pressed due to pressure, especially during impression-making, and it can lead to inaccurate impressions. Fabrication of full dentures with inaccurate impressions will lead to failure in providing adaptation, retention, and stabilization to the denture. The objective of this case report is to describe the use of the window impression technique for a patient with a flabby tissue ridge. A male patient came to Unjani Dental Hospital with major concerns about a completely edentulous ridge. The patient had a bad experience with full dentures due to pain while using them, especially in the anterior maxilla, and therefore, he never used the denture. There was no history of medical or systemic condition, and the patient wanted to make a new denture. On

intraoral examination, an area of flabby tissue was observed in the anterior maxilla ridge. The patient was then planned for a full denture fabrication with a window impression technique for his maxillary anterior flabby tissue. The window impression technique was able to prevent pressure while impression-making and provide a well-fitted denture.
Keywords: flabby tissue; full denture; impression

ABSTRAK

Pembuatan gigi tiruan pada pasien tak bergigi dengan jaringan flabby dapat menyebabkan kesulitan pada prosedur penceakan karena terdapat perbedaan kompresibilitas antara jaringan flabby dan jaringan lunak lainnya. Jaringan flabby dapat tertekan karena tekanan selama prosedur pencetakan dan hal tersebut dapat menyebabkan pencetakan yang tidak akurat. Pembuatan gigi tiruan lengkap dengan pencetakan yang tidak akurat dapat menyebabkan kegagalan dalam mendapatkan adaptasi, retensi, dan stabilisasi untuk gigi tiruan. Tujuan utama dari laporan kasus ini adalah untuk menjelaskan penggunaan teknik pencetakan window untuk pasien dengan jaringan flabby. Pasien laki-laki datang ke Rumah Sakit Gigi dan Mulut Unjani dengan keluhan utama kehilangan seluruh gigi. Pasien memiliki riwayat pengalaman tidak baik dengan gigi tiruan karena adanya nyeri selama penggunaan dan terutama pada daerah anterior rahang atas dan pasien tidak menggunakan gigi tiruan tersebut. Tidak terdapat riwayat medis atau kondisi sistemik dan pasien ingin membuat gigi tiruan yang baru. Pada pemeriksaan intraoral didapatkan jaringan flabby pada daerah anterior linggir rahang atas. Pasien kemudian direncanakan untuk pembuatan gigi tiruan lengkap dengan teknik pencetakan window untuk jaringan flabby pada anterior rahang atas. Teknik pencetakan window dapat mencegah tekanan pada jaringan selama pencetakan dan memungkinkan pembuatan gigi tiruan lengkap yang sesuai dengan pasien.

***Kata kunci**: full denture; impresi; jaringan flabby*

INTRODUCTION

Fabrication of completely edentulous patients with flabby tissue can lead to difficulty because of its compressibility. Flabby tissue or hypermobile tissue may cause problems with complete dentures, such as pain during usage and displacement of the denture. Flabby tissue, which occurred in approximately 24% of the maxillary edentulous ridge and 5% in the mandibular edentulous ridge, is determined by its deformable and displaceable state in the alveolar ridge.[1,2]

The displacement or distortion of flabby tissues by force during impression-making is the primary concern in the fabrication of complete dentures, which can lead to inaccurate impressions and cause displacement of the denture.[3] The management of flabby tissue has been proposed using three different modalities, such as surgical removal of displaceable soft tissue before denture fabrication, implant retained prosthesis, and non-surgical approach using modified impression technique.[1,3,4]

A modified impression technique must be performed to achieve accurate recording of hypermobile tissue.[1–3] Failure to achieve accurate recording of hypermobile tissue will lead to inaccurate impressions and cause failure in adaptation, retention, and stabilization of the denture. Several methods have been employed to overcome this problem, such as the window impression technique.[1,2,5]

In this case report, the authors describe a case in which the modified impression technique using window impressions was used in a maxillary flabby ridge patient.

CASE REPORT

A 66-year-old male patient came to the Prosthodontic Clinic of Unjani Dental Hospital, Cimahi, with complaints of an ill-fitting denture constructed two years ago. The patient did not use his complete denture during eating because of displacement and pain while wearing the denture. The patient only used the denture to provide aesthetic and phonetic functions in social activities. The patient made another complete denture with a different dentist six months ago, and the problem persists, so he did not use his new denture. There is no history of medication or systemic disease, but the patient wanted to make a new denture.

Figure 1. Extraoral examination of the patient.

Figure 2. Intraoral examination of the maxillary ridge.

Figure 3. Intraoral examination of the mandibular ridge.

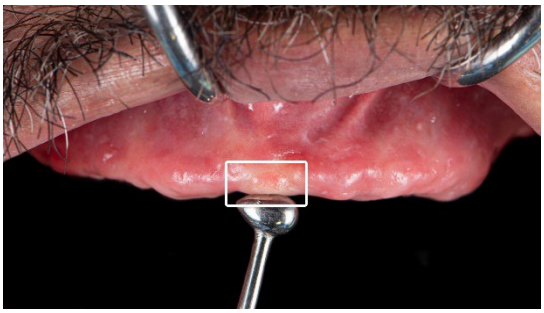

Figure 4. Flabby tissue identification in a maxillary ridge.

An extraoral examination of the patient was done (Figure 1), and then an intraoral examination of the maxillary ridge (Figure 2) and mandibular ridge (Figure 3). Further, alveolar ridge resistance (compressibility) was examined using a burnisher, and there were certain areas in the anterior maxillary ridge which was distorted while pressed and identified as flabby tissue (Figure 4, white rectangle).

First, a preliminary impression was taken with alginate impression material using an edentulous metal stock tray, which is the right size for the patient. A preliminary cast was poured with Type IV dental stone, and the flabby tissue area was identified on the cast. The window custom tray was fabricated using self-cured acrylic as follows: (1) The border of the tray was determined to be 2 mm less than the vestibulum, (2) A flabby tissue area was marked on the cast, (3) A baseplate wax sheet was applied to the cast to create a tray spacer except for the flabby tissue area, (4) Stopper was made in 4 areas excluding flabby tissue area, (5) Self-cured acrylic resin tray material was applied to cover the baseplate wax sheet (spacer).

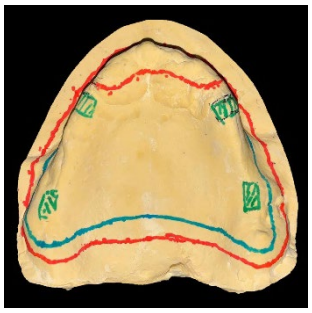

Figure 5. Custom tray design.

The custom tray was tested in the patient's mouth, and the border of the tray was adjusted to be 2 mm less than the vestibulum. Then, the muscle trimming procedure was performed using greenstick compound by recording the border of movable and immovable tissue in the vestibulum. A physiological impression was taken with light-bodied elastomeric impression material in two phases.

The first phase of the physiological impression was done by removing the wax spacer from the custom tray and making escape holes to prevent compression during the impression-taking procedure. The first phase physiological impression was taken in all areas of the custom tray except for the window area (flabby tissue), which needed to be left out and waited for the setting of light-bodied elastomeric impression material.

The second phase of physiological impression was taken subsequently and must be done with the custom tray still in the patient's mouth. The second phase of physiological impression was done with light-bodied elastomeric impression material applied to the window area (flabby tissue) without pressure to prevent compression of the tissue. A working model cast was poured using Type IV dental stone with beading and boxing procedure (Figure 6).

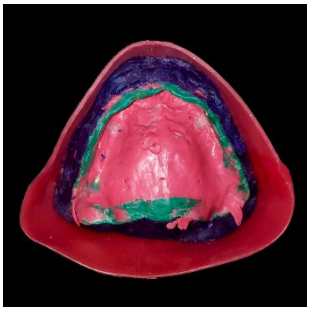

Figure 6. Beading and boxing procedure.

Fabrication of the complete denture was done using a working model cast with conventional procedures. After processing the complete denture, the denture was inserted intraorally, and the patient was given instructions for the use and home care of the prosthesis. Follow-up was done one week, one month, and six months after the insertion, and the patient was satisfied with the denture in comparison to the previous dentures.

Figure 7. Post insertion of the complete denture.

DISCUSSION

The major aim of complete denture fabrication is to restore function esthetics and maintain patients' health. There are three basic principles in good denture: retention, stability, and function. Compressibility of flabby tissue in denture wearer can lead to instability, loss of denture retention, and dislodgement due to the elastic recoil of the fibrous soft tissue during function. Thus, it needs to be managed.[1–3,5]

Flabby tissue is commonly found in the elderly, with no sex predilection.[6] Flabby tissue is described as mobile or resilient tissue with little evidence of underlying supportive bone. Flabby tissue usually arises in some complete denture wearers where the alveolar bone has been replaced by fibrous tissue. It is also particularly evident in the maxillary anterior, especially when only mandibular anterior teeth remain.[7]

Flabby tissue can be caused by excessive occlusal loading on the residual maxillary ridge and/or unstable occlusal relationships elsewhere in the mouth.[7] The inspection of flabby tissue may be difficult as the colour and texture of the tissues are similar to normal unless they are swollen.[8] The flabby tissues are often pressed during impression taking and tend to recoil and dislodge the overlying denture under a masticatory load.[6]

Management of flabby tissue is a critical issue faced by clinicians and prosthodontists.[9] In general, there are three modalities in managing flabby tissue: surgical approach, implant-retained prosthesis, and non-surgical approach.[1–4] The optimal option in managing flabby tissue is determined by the health of the patient, the clinical state of residual alveolar ridges, financial circumstances, and the ability of the clinicians.[1]

A surgical approach can be advocated by removing fibrous tissues which can interfere with complete dentures. Surgical approaches tend to be more difficult to do and also more complex than non-surgical approaches. It also has limitations in patients with medical or systemic conditions.[8]

An implant-retained prosthesis is a prosthesis that is supported by a dental implant. This approach tends to be more complex than the other modalities, especially for the implant placement. An implant placement procedure must be done using a surgical procedure and requires sufficient space in the alveolar bone. It also has limitations in patients with medical conditions or systemic, such as surgical approach.[10]

The last modality is the non-surgical approach, which is commonly

taken by using modified impression techniques. Modification of impression techniques aims to prevent compression during the impression-taking procedure. Conventional impression techniques often lead to displacement of fibrous tissue, which can lead to distortion and cause displacement of the final denture.[11]

Many studies have reported a variety of impression techniques and methods for recording flabby tissue through the non-surgical approach. Yet, there is no proof that a particular technique is better than the other.[12] The window impression technique is a modification that is considered a selective pressure impression technique.[13] Selective pressure impression technique is an additional technique wherein the area with flabby tissue is given more relief. There are several methods for providing relief, such as perforated trays, double spacers, and windows.[14]

The fabrication of a window in a custom tray as an escape hole, in this case, report, ensures that no or little pressure is exerted on the flabby tissue during impression taking. The window will also allow the flabby tissue to be in a rest state, which is a condition when there is no displacement or compression.[13]

Impression materials are also considered an important aspect in the management of flabby tissue, especially in a non-surgical approach.[15] Originally, the main choice of impression material in window technique is impression plaster, which has low viscosity.[16]

In this case report, polyvinyl siloxane is the option for impression materials because of its ability to record the tissue in a static state. Polyvinyl siloxane also offers various viscosities which can be appropriately taken whether the technique is chosen.[15] All of the considerations taken in this case are mainly aimed at providing minimal or no pressure during impression taking and will lead to better accuracy. Success in minimizing tissue displacement during the impression-taking procedure will lead to the optimum fabrication of the denture.

In this case report, the patient was satisfied with the denture in comparison to the previous denture; this indicates the effectiveness of the window impression technique in managing the flabby tissue during the fabrication of the denture.

CONCLUSION

The window impression technique was effective in preventing pressure, which will lead to compression during impression-taking procedures and became one of the major aspects in providing well-fitted dentures for patients with flabby tissue.

CONFLICT OF INTEREST

The authors reported no potential conflict of interest.

ACKNOWLEDGEMENT

Our gratitude goes to the faculty of dentistry Universitas Jenderal Achmad Yani, Cimahi, and RSGM Unjani who have helped with this case report and draft paper.

REFERENCES

1. Labban N. Management of the flabby ridge using a modified window technique and polyvinylsiloxane impression material. Saudi Dental Journal. 2018 Jan 1;30(1):89–93.
2. Mostafa AZH, Alanazi SM, Almarshedy SM. Custom double tray for a special impression technique for flabby maxillary residual ridge: Case report. Clin Case Rep. 2022 Mar;10(3).
3. Zilpilwar N, Nimonkar S, Dubey SA, Belkhode V. Addressing Flabby Ridges in Complete Denture Patients: A Case Report. Cureus. 2024 Jul 7;
4. Yee A, Meei TI, Ling GC. Managing Fibrous Maxillary Ridge: A Case Series of Impression Techniques. Prim Dent J. 2023 Mar 1;12(1):51–6.
5. Colvenkar S, Cherukuri VP, D. SJ, V. RS, Vanapalli J. Management of Flabby Edentulous Ridge Using the Window Impression Technique. Cureus. 2023 Jul 4;
6. Ştefănescu CL, Zaharia A, Murineanu RM, Puşcaşu CG, Sachelarie L, Grigorian M. Flabby ridge, a challenge for making complete dentures. Applied Sciences (Switzerland). 2021 Aug 2;11(16).
7. Zarb G, Bolender C, Eckert S, Jacob R, Fenton A, Mericske-Stern R. Prosthodontic Treatment for Edentulous Patient: Complete Dentures and Implant-supported Dentures 13rd Edition. 2013.
8. Sharma S, Ravi Kiran S, Shankar R. Rehabilitation of Flabby Ridges for Denture Fabrication: An Enigma for Dental Professionals. Cureus. 2024 Jun 14;
9. Lalwani R, Khubchandani SR, Bhoyar A, Dubey SA. Prosthodontic Rehabilitation of the Flabby Edentulous Maxilla Using Hobkirk's Technique: A Case Report. Cureus. 2024 May 29;
10. Srivastava S, Mishra S, Chopra D. Modified tray with mesh design for the management of flabby ridge: A case report. Front Dent. 2019 Mar 20;16(2):149–52.
11. Bute SA, Bansod A, Beri A. Striving for Excellence: Fabrication of Complete Denture in a Patient With Flabby Ridges Using Specialized Impression Technique. Cureus. 2024

Jun 23;
12. Zarone F, Ruggiero G, Di Mauro MI, Spagnuolo G, Ferrari M, Sorrentino R. Accuracy of three impression materials on the totally edentulous maxilla: In vitro/in silico comparative analysis. Materials. 2020 Feb 1;13(3).
13. Shin JO, Ko KH, Huh YH, Cho LR, Park CJ. Displacement of Simulated Flabby Tissue by Different Tray Designs and Impression Materials. Journal of Prosthodontics. 2019 Apr 1;28(4):444–51.
14. Pai UY, Reddy VS, Hosi RN. A Single Step Impression Technique of Flabby Ridges Using Monophase Polyvinylsiloxane Material: A Case Report. Case Rep Dent. 2014;2014:1–6.
15. Algabri R, Altayyar S, Alsaed N, Mostafa M, Alqutaibi AY, Swedan M. Alternative prosthetic approach in the management of flabby edentulous anterior maxilla: A case report and literature review. Saudi Journal of Oral Sciences. 2023;10(3):189–94.
16. Beri A, Pisulkar SK, Bansod AV, Godbole S, Shrivastava A. Rehabilitation of Edentulous Patient with Customized Functional Palatal Contours. Journal of Datta Meghe Institute of Medical Sciences University. 2023 Dec 28;18(4):767–71.