

Making impression for distorted flabby anterior lower ridge a comparative study

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Abstract:

Confusion may exist in facing the problem of impressions for hypermobile mucosa specially when the problem is how to make this impression, various techniques have been advocated and the proper selection of one technique or another depends on available knowledge of functional and histologic anatomy for the development of impression procedure with a wide difference in the interpretation of the denture foundation. Impression pressures have been thought to be a primary cause of tissue displacement and consequently a factor of denture instability. This study was carried out to compare 2 different impression techniques for anterior flabby lower ridge, it has been concluded that more retention with better patient satisfaction were gained with lower dentures made using the window impression technique.

Keywords:

Flabby ridge, window impression technique.

Introduction:

A problem existing in some old aged patients with long time edentulism requiring a lower complete denture, is that the residual ridges usually become flat, that's because of the continual loss of the cortical layer of bone underlying soft tissues. Weakened anterior part changing in form through rapid resorption of the cancellous portion of the mandible forming a concave bearing surface, such a progressive irreversible resorption may often be seen in the anterior part of the mandible, a condition called a "flabby ridge", where it may become displaceable due to fibrous tissue deposition, occurs when natural

teeth oppose an edentulous ridge⁽¹⁾, or as a result of an ill fitting denture and when excessive force usually cannot be tolerated by the anterior part of the residual ridge and will likely cause increased resorption of bone and development of hyperplastic tissue in the region⁽²⁾. A flabby ridge causes instability of the denture.

Many impression procedures have been developed on an empirical basis, the individual abilities and individual operators have led them to devise impression procedures which are particularly good in their own hands, but which others may be unable to handle successfully. Others have devised procedures which are best suited to certain materials which the

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manufacturer's have urged them to use⁽³⁾.

Impression pressures have been thought to be a primary cause of tissue displacement and consequently to be a factor in denture instability⁽⁴⁾.

Literature review

Confusion may exist during examination of the current dental literature about the problem of impressions for complete dentures, where it clearly resulted from the problem of impression making, some devised procedures depending on the available knowledge of functional and histologic anatomy for the development of their impression procedures but the variation of these techniques indicates a wide difference in the interpretation of the foundation for dentures. Other devised procedures best suited to certain materials which the manufactures have urged them to use. Still others have ignored anatomic limitations, and have devised techniques for impressions on a purely arbitrary basis^(3,5).

Hypermobile mucosa is a condition typically occurring following advanced atrophy of the alveolar bone, leaving a pendulous mass of mucosal tissue unsupported by bone^(6,7).

A number of different methods deals with this problem have been described. One of which is surgery involving the removal of the fibrous tissue to leave a firm ridge, where it was claimed that the removal of this shock absorbing flabby ridge may lead to trauma of the underlying bone, with an increased bulk of denture materials⁽¹⁾.

Other techniques involved constructing a denture over the flabby ridge and where the impressions are usually made either with mucostatic or mucodisplacive. They claimed that when

the denture was put under load then instability may occur, whereas with the mucodisplacive impression technique the denture will only fit well when the denture is under load, it may be unstable when at rest, due to tissue recoiling back into its original position thus displacing the denture⁽¹⁾.

T. Leung (2002) classified the impression techniques into mucostatic, mucodisplacing and selective displacement, he claimed that selective displacement may be used in flabby ridges, where too low viscosity material is used for the flabby ridge area through a window made in a close fitting special tray on the flabby area.

The window technique have also been described for making impression of hyperplastic tissue to be recorded and without displacement and that's by opening a window in the impression tray over the hyperplastic tissue, then by making an impression in impression paste (zinc oxide / eugenol) for the rest of the ridge and once it has set, impression plaster (mucostatic) is painted over the flabby ridge and allowed to set and removed as one impression⁽¹⁾.

Dresen in 1958⁽⁸⁾ carried on a study to evaluate the rubber base as an impression material for full denture using two different impression techniques a) an open mouth technique, and b) closed mouth technique.

Smith et al, in 1999⁽⁹⁾ made an impression with a spaced tray, the thickness of the spacer they claimed insured even thickness of the impression material, so as to control pressure on the tissues, through making holes in the tray thus helping to prevent the built-up of hydro-static pressure, they claimed that such a design may enhance the clinical effectiveness of the prosthesis⁽⁹⁾.

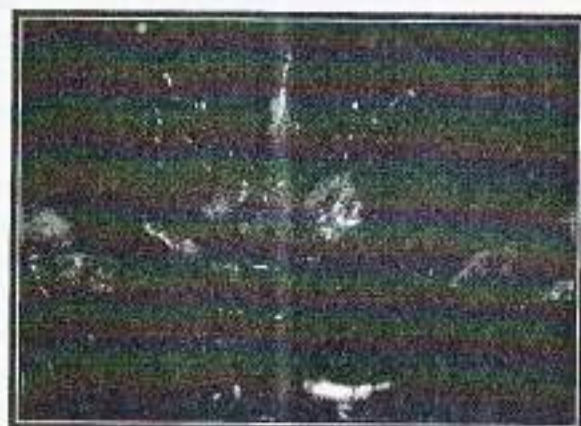
And lastly Khamas, Hamid, and Al-salihi 2003⁽¹⁰⁾ conducted a clinical comparative study on patients with flabby anterior upper ridge using two different techniques, the window and the spaced with drainage holes techniques, they concluded that the spaced with drainage holes technique may be recommended as an alternative procedure to the window technique.

Aim of the study

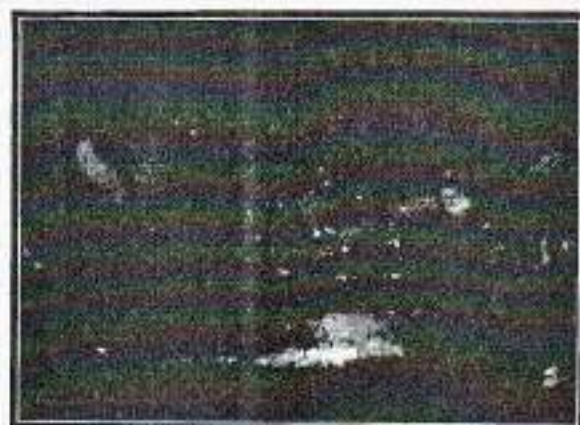
1. To compare the amount of tissue displacement with the two different methods used for recording flabby anterior lower ridge.
2. The final seating retention, stability and according to patient satisfaction of 2 complete dentures made by the two different impression methods.

Materials and methods:

Ten fully edentulous patients ranging from 55 – 70 years of age having a flabby anterior part of their lower ridges (Fig. 1-a), (Fig. 1-b) and (Fig. 1-c), selected from the Prosthodontic Clinic – College of Dentistry – Baghdad University.



(Fig. 1-a): A fully edentulous patient with a flabby anterior part of their lower ridge.



(Fig. 1-b): A fully edentulous patient with a flabby anterior part of their lower ridge.



(Fig. 1-c): A fully edentulous patient with a flabby anterior part of their lower ridge.

Two lower impressions each made with one of the two different suggested techniques for each patient. The primary impression for all patients was made with impression compound and poured in the dental stone. Then 2 special trays were made for each patient in order to be used for recording the 2 different impression techniques:

1. Impression procedure with zinc oxide impression materials:

Border of the close fitting lower special tray was cut about 1-2 mm shorter off the sulcus, then the border molded using tracing impression compound sticks, an impression was

made using zinc oxide impression pastes, when the impression is set, it is removed, after which it is checked for accuracy, retention and stability.

2. Impression procedure for window technique:

A close fitting lower special tray was constructed, border is again cut for about 1-2 mm shorter off the sulcus. The flabby area is marked on the ridge inside the patients mouth with an indelible pencil then the previously marked area is recorded and cut from the tray making a window for the flabby anterior part of the ridge (Fig. 2-a) and (Fig. 2-b).

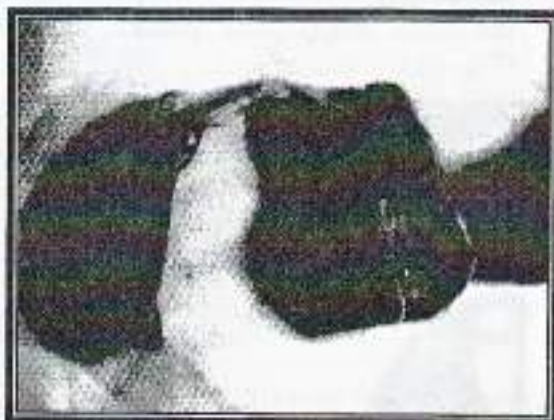


(Fig. 2-a): The marked flabby anterior part of the lower ridge cut from the special tray.



(Fig. 2-b): The marked flabby anterior area on the ridge was cut away from the special trays as seen on the cast.

Tracing impression compound sticks was used to record the impression surface as well as for border molding (Fig. 3)



(Fig. 3): Trays were filled and border molded with impression tracing compound sticks.

An impression was made using zinc oxide impression paste for the area covered by the tray except the cut away anterior window (Fig. 4).



(Fig. 4): A zinc oxide / eugenol impression is removed from the patient mouth after being set.

Once the material is set the tray was removed and inspected for accuracy, readapted in the patient's mouth in its previous proper position.

A thin mix of impression plaster was gently painted over the flabby ridge with

a fine camel hair brush layer after another (Fig. 5) by more than one application until the whole area showing through the window is properly and completely covered with a good thickness impression plaster material (Fig. 6).



(Fig. 5): The lower special tray with the window being adapted on the patient lower ridge, with the impression plaster gently painted a layer after another.



(Fig. 6): The window area is completely covered with a good thickness of impression plaster material.

The whole tray with the impression recorded by the two different impression materials is removed gently (Fig. 7), beaded, both impressions made with the two different impression techniques were beaded, boxed and then poured with dental stone.



(Fig. 7): The whole tray with the impression recorded by the two different impression materials.

3. Measurements:

Two reference points were chosen intra-orally the first one was at the crest of the ridge and the second was at the base of the sulcus both in the midline for the chosen flabby area was always anteriorly situated crossing the midline (Fig. 8).

The measurement was carried on using "tacro caliper" and a "ruler", the tacro caliper measured the distance, and the measurement was transferred to the ruler.



(Fig. 8-a) Tacro caliper used to measure the distance.



(Fig. 8-b): Tacro caliper used to measure the distance

The distortion in the flabby lower anterior ridge area, and during the two impression procedures or techniques were determined by the difference between the two measurements compared with the original distance before impression making measured in (mm), and on the final models (stone cast) and for each patient.

4. Patient questionnaire:

A case sheet was made for each patient who was delivered a single upper denture and 2 lower complete dentures and asked to wear each one for one month to get adapted to it.

Every week the patient should visit the clinic periodically to make the necessary adjustment, and at the end of the month an evaluation was made for checking the stability, retention, and patient satisfaction and comfort by denture examination and a list of questionnaires were filled by the dentist through asking the patient several questions as listed below⁽¹¹⁾:

1. Are you satisfied with your dentures?

Yes, they are satisfactory in all aspects.

Yes, they are satisfactory in most ways but have some faults.

No, they have several faults but I can wear them.

No, they have so many faults I can't wear them.

2. Are you satisfied with how well your lower denture stays in place?

No, the lower denture is so loose I don't like to wear it.

No, the lower denture often comes loose while I am eating or speaking but I can wear it.

Yes, the lower denture stays in place most of the time.

Yes, the lower denture always stays in place.

3. Are you satisfied with how well you chew food with your dentures?

Yes, I am able to chew all foods.

Yes, I am able to chew all but a few foods.

No, I am not able to chew food very well.

No, I am not able to chew food with the dentures.

4. Are you satisfied with how well you speak with your dentures?

Yes, I have no trouble speaking.

Yes, once in a while I have a few problems speaking.

No, speaking is always a little difficult.

No, speaking is always very difficult.

5. Are you satisfied with the comfort of your lower dentures?

No, I almost never wear the lower denture because it is so uncomfortable.

No, I can wear the lower denture but my lower jaw is sore most of the time.

Yes, the lower denture only sometimes causes discomfort.

Yes, the lower denture never causes any discomfort.

Results:

Each measurement was repeated three times and a mean value was calculated as shown in the following table:

Patient No.	Intra-oral measurement	Close fitting special tray technique	Window technique
(1)	7.5 mm	6.5 mm	7.5 mm
(2)	10.0 mm	8.5 mm	10.0 mm
(3)	8.5 mm	7.5 mm	8.5 mm
(4)	6.0 mm	5.0 mm	6.0 mm
(5)	5.25 mm	3.5 mm	5.0 mm
(6)	8.75 mm	7.5 mm	8.5 mm
(7)	10.0 mm	8.75 mm	9.75 mm
(8)	7.5 mm	6.0 mm	7.5 mm
(9)	7.0 mm	6.0 mm	7.0 mm
(10)	8.25 mm	7.0 mm	8.0 mm

Retention and stability was evaluated by the investigators comparing the 2 lower complete dentures for each patient, then the patient was asked several questions to evaluate the retention and stability from the patient's point of view in between the two lower dentures made for each patient and record his satisfaction and preference for which one of the dentures where he feels most comfortable with. Results shown that all patients claimed that the dentures made with the window technique was the most comfortable, with better retention and stability except for one female patient who didn't notice any difference between the two of the differently made lower dentures.

Discussion:

Many of the various techniques for making lower complete dentures continue to be quite widely used. However, the techniques most generally advocated and accepted are those which when using a material designed to reproduce details with minimum distortion, produces bearing surface in the denture, and with intimate contact with a maximum coverage, within the physiological limit⁽⁵⁾.

As shown from the results of this study, there was no or little difference in the measurements when using the window technique from the original distance (intra-oral measurements). While with

the pressure techniques (zinc oxide / eugenol with close fitting special tray) where it causes more displacement of the tissue in comparison to the window technique. This is due to the fact that the flabby tissues are not distorted when we use the window technique (mucostatic state for the flabby tissue).

90% of the selected patients who were delivered 2 lower complete dentures made with the two different techniques insisted on more satisfaction and retention with the dentures that were made with the window technique rather than the close fitting pressure technique when requisitioned and evaluated after 1 month of using each denture.

Conclusion:

This study concluded that making a lower anterior flabby ridge impression with a window technique could give the best results for a lower complete denture retention, stability and satisfaction from both the dentist and patient's point of view.

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