IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 11 Ser.4 (November. 2021), PP 50-54
www.iosrjournals.org

Prosthodontic management of Flabby ridges using effective Impression techniques.

Dr. Chandan R. Sengupta[1], Gauri Kiran Vanjari[2]
Department of Prosthodontics, Crown, Bridge and Implantology, Yogita dental college and Hospital, Khed, Ratnagiri, Maharashtra University of Health Sciences, India.

Abstract:
Denture fabrication on a flabbly ridge can be a Herculine task for clinicians as denture fabricated on such a ridge could lack stability and give disappointing results. Special care should be taken by the clinicians while treating such cases. Modifications of conventional impression techniques can be useful aid while treating such cases. These techniques unable the clinician to appropriately record the distorted tissues and fabricate a denture that is stable and retentive. In this article we reviewed various impression techniques that can be implicated for fabricating a denture on flabbly ridges.

Keywords: *Fibrous ridges, Flabby ridges, Impression techniques, Complete Denture, Combination Syndrome*

Date of Submission: 05-11-2021 Date of Acceptance: 20-11-2021

I. Introduction:

Edentulism is an important global public health issue due to its high prevalence which exceeds 10% in adults aged ≥ 50 years and the associated disability [1,2]. Complete denture rehabilitation remains one of the most popular and traditional prosthodontic treatment approach for these patients who may have systemic, anatomic, and/or financial limitations.

Success of the complete denture prosthesis is entirely dependent on the support of soft tissues that is the mucoperiosteum and underlying hard tissue which is the bone. The health and quality of these tissues is therefore a very important determining criteria for the success in wearing of complete dentures. Bone, although one of the hardest tissues of human body, is biologically a highly plastic tissue and in the places where it is covered by a vascularized connective tissue, it is exceedingly sensitive to pressure.

The residual alveolar ridge, lined by masticatory mucosa is attached to underlying periosteum. If this attachment is lost, there is a loss of denture stability. A flabby ridge or fibrous ridge (excessive, mobile tissue ;GPT-9) is one where hyperplastic soft tissue replaces the resorbed alveolar ridge. It shows marked fibrosis, inflammation and resorption on the underlying bone. Flabby tissues and resorbed ridges pose a very serious threat to stability, retention and support of the complete denture prosthesis. Thus, condition of denture bearing tissues profoundly affect the success of complete denture prosthesis and every possible care should be taken to ensure that the hard and soft tissues are developed in a form that will enhance patients ability to wear a denture as Winkler says," The ridge has to be modified, if and when required in ways, that will prepare the ridge, to receive the denture."[3]

This problem associated with flabby ridges and ridge resorption was first described by Kelly in 1972 as 'Combination syndrome'. It is seen in patients wearing maxillary complete denture opposed by natural anterior teeth and bilateral mandibular distal extension prosthesis. The progress of this condition occurs when the patient tends to concentrate the occlusal load on the remaining natural teeth for proprioception as a result of which there is maximum force acting on the anterior portion of the maxillary denture. This leads to increased rate of resorption in the anterior region of maxilla which gets replaced by flabby tissues and there is a gradual resorption of the distal extension residual ridge in the mandible. From a clinical perspective, fabrication of retentive maxillary denture for such a flabby ridge may be very challenging and needs careful treatment plan. In the following article, we aim to review various treatment modalities for the management of the same.

The problem of flabby ridges can be either solved by modification of conventional impression techniques, placing implant retained prosthesis or by surgically removing the flabby ridge. Each of these have its own set of advantages and disadvantages.

Choice of technique: The choice of treatment is based on the severity of the condition and decision is made after the inflammation has been adequately treated. To achieve this, patients existing denture should be corrected or a new interim denture is given. Tissue conditioning may also help. After the inflammation has been taken care of, a thorough examination is carried out to check for persistence of freely displaceable, pendulous, fissured, foldable tissue. If movable tissue can be localized and is not expected to interfere with the stability of

denture, then the tissue can be retained using a non-pressure mucostatic impression technique. However, if the tissue is pendulous, excessive and interferes with the stability of denture, surgical removal is considered.

According to Laskin, the surgical reduction of a flabby ridge covered by scarred mucosa can lead to disruption of anatomic foundation unless vestibuloplasty is carried out. If the tissue still remains displaceable, pendulous, folded, fissured and some underlying alveolar bone remains after rest, then surgical reduction by sharp dissection is indicated. On the other hand, if mobility decreases, shrinkage occurs and inflammation has subsided, one can proceed with mucostatic impression technique. In this article, we reviewed various modifications of conventional techniques that can be used to fabricate denture on flabby ridges.

II. Impression Techniques:

Osborne Technique[4] :

In this technique, the preliminary impression is taken using stock tray. Irreversible hydrocolloid material, alginate is used as it causes minimal distortion of mobile tissues. The cast is poured and the area of flabby tissues is marked on the cast. A modified tray is fabricated with a spacer of 1 mm thickness using autopolymerising resin. A window is created on the tray over the marked area and finger stops are given. The peripheral extension is adjusted such that it is 2mm short of the functional sulcus. Border moulding is carried out using softened green stick compound till functional sulcus is recorded. Final impression is carried out using a Zinc oxide eugenol. Impression is removed, material escapes through the window. Now the tray is trimmed and positioned back in the patients mouth. Impression plaster is applied on the flabby ridge. This material should be stiff. Once the material sets, the impression is carefully removed and separating medium is applied to the plaster area. The cast is now poured with Dental stone and flabby ridge gets recorded in minimally displaced form.

Modified William Filler's Technique [5]:

In this technique, Preliminary impression of maxillary and mandibular arch is recorded with irreversible hydrocolloid material, alginate using a stock tray. Plaster casts are poured. Casts are then placed on the surveyor and all the tissue undercuts are blocked out using utility wax. A single thickness of baseplate wax is placed over the cast to be used to be used a spacer. Spacer is trimmed over the PPS area so the tray material will contact soft tissue in this area. Tin foil substitute is applied to the cast and first of the two trays is made with cold curing acrylic resin. Maxillary and Mandibular trays are keyed in at least three places. These key positions correspond with an extension of second tray and will ensure proper seating of the second tray over the first. The first tray is entirely covered with the baseplate wax, ensuring that the keyed positions are kept free of wax. Both first resin tray and casts are painted with a tinfoil substitute. Second trays are made in a similar manner and extended past the relieved area of maxillary and mandibular trays. A no.8 round bur is used to make numerous holes in the second tray. Stops are made by removing the deepest portion of the vault of the maxillary tray.
Clinical technique for impression: Border moulding is carried out using a green stick impression compound. The baseplate is then removed and flanges are reduced by 1-2mm from all the areas except on the part over tuberosities and PPS. Mandibular tray is stabilized by adding modelling plaster on the buccal flanges in region of first and second molars and central incisor area. Lingual flanges are made free from undercuts but aren't reduced. Now the maxillary and mandibular trays are painted with adhesives. Light bodied Impression material is used in initial tray as a corrective wash material. Tray is removed as the impression sets and excess material is trimmed off. Second impression is taken with Plastogum as corrective white wash material. The trays are seated over the ridge until the keyed parts are in contact with each other and minimal pressure is applied. After the impression is recorded, the two trays are sealed together with wax and boxed in usual manner and casts are poured with dental stone.

Zafrulla Khan Technique[6]:

A preliminary impression is made and a study cast is poured with a dental stone. Movable unsupported tissue is outlined on the cast with a pencil. Fabrication of a single custom tray is done and an opening is cut on the tray by transferring the pencil line. Bilaterally, the modelling plaster is adapted on the posterior aspect of the tray to act as handles. A routine border moulding is carried out after adapting the tray in the mouth. Then the tray is painted with an adhesive Permalastic and regular body permalastic is used for recording the final impression. The excess material is then trimmed and completed base impression is returned to the mouth such that is does not come in contact with unsupported tissues. The shape of unsupported tissue is now recorded using impression plaster with is a highly mucostatic impression material. A separating medium is applied to the impression plaster and cast is poured.

Hobkirk's technique[7]:

This is a technique where a single custom tray is used. Border moulding is carried out in the usual manner. Impression is recorded using heavy bodied addition silicon. Areas of removable tissue are cut out. Relief holes are made. Wash impression is made using light bodied impression material.

Walter's technique [8]:

Preliminary impression is taken with irreversible hydrochloride compound and a preliminary cast is poured. Custom tray is fabricated on the preliminary cast which should cover posterior residual ridges and palatal tissues with flanges extending in to the buccal vestibular spaces. The tray is finished short of lingual surfaces of remaining anterior teeth and should not extend in to labial vestibular spaces. First molar regions of the tray are given short handles and an overlying tray is prepared to cover the custom tray and remaining teeth. A spacer is used to separate the overlying tray from the structures that it covers except for the flattened ends of the short handles. A buccal extension of the overlying tray is kept well clear of the borders of the custom tray but an anterior flange extends in to the labial vestibular space. Correct extensions are checked in the patients mouth and custom tray is held in position. If the trays have been correctly constructed the vestibular space is occupied by the buccal flange of the close fitting tray to a point just distal to the last natural tooth present. Labial flange of the over tray occupies the remaining part of the vestibular space. The extension of the flanges should be just short of the reflection to allow the impression material to develop a proper border seal. Zinc oxide eugenol impression paste is used to record the impression in the custom tray while irreversible hydrochloride impression material is loaded in to the over tray and placed in the mouth. Thus by using this technique the impression of the existing support tissue is obtained with controlled mucosal displacement. The borders are molded under controlled conditions as irreversible hydrochloride is used to register only the labial vestibular space. The success lies in the correct registration of buccal and labial vestibular spaces to aid retention. It is difficult to achieve these by single irreversible hydrocolloid impression. A composite impression technique like this allows the dentist to vary stress on different supporting tissues in the same mouth and utilise different impression materials in the same mouth.

Splint Method by Allan Mack [9]

This technique is used when the tissues are excessively and exceptionally flabby. A loosely fitting tray or special tray is made with heavy relief over the flabby area to a thickness of about 3mm and is allowed to settle. Tray is fitted with second mix of plaster and the impression is made. The initial coating of the flabby areas thus acts as a splint. It gets removed with second impression.

Modified Fluid wax technique by Kian Tan et al[10]

The use of Fluid wax technique for making impression was previously described by Everett.(I could not find the article on pubmed, says login to access). In modified fluid wax technique, preliminary impression is recorded using irreversible hydrocolloid impression material stock tray. The impression is then poured in type III dental stone. A custom tray is fabricated on the preliminary cast using light-polymerized acrylic resin tray material. Border extension of the tray is adjusted to be at least 2 mm short of the vestibules on the preliminary cast. Soften modeling plastic impression compound is place on the intaglio surface of the tray, corresponding to the region of the mandibular central incisors and both the mandibular first molars, to serve as spacers for impression wax. Border mold the tray with modeling plastic impression compound in segments. Remove the spacers with a scalpel blade once the border molding is completed. Trim the tray over the crest of the residual ridge, and create a window opening above the displaceable alveolar ridge using a No. 8 round bur. Determine the size of the window opening according to the extent of the displaceable tissues .Melt the mouth temperature impression wax in a container held in a water bath at 42°C, and apply the impression wax onto the borders of the tray with a wax spatula while it is still fluid. Ensure that the temperature used to melt the impression wax is less than the working temperature of the modeling plastic impression compound used in the border molding procedure, to prevent distortion. Place the impression tray over the edentulous ridge, and leave it in the mouth for approximately 5 minutes. Allow adequate time for the mouth temperature impression wax to flow and escape to the periphery of the impression, as well as to solidify. Remove the impression tray from the mouth and cool it immediately in water at room temperature. Add impression wax in increments on the periphery until a definite reproduction of the muccobuccal fold is obtained. Apply impression wax to capture the remaining surfaces of the residual ridge. Add impression wax onto the, in increments, until a glossy surface is visible. Trim away any excess impression wax on the periphery or over the window opening with a scalpel blade. Apply adhesive on the tray in the area surrounding the window opening, and allow it to dry. Place the impression tray onto the residual ridge and inject vinyl polysiloxane impression material over the window opening. Prevent distortion of the soft tissues by placing the impression material in the most passive manner possible. Gently blow air onto the impression material to allow the spread of the impression material over the mucosal surfaces.

Allow the impression material to polymerize Remove, disinfect, and box the impression using a mix of plaster and pumice Pour the impression in type III dental stone . Application of vinyl polysiloxane impression material over window opening. Completed modified fluid wax impression.

One part impression technique (Selective perforation tray)[11]

This is usually considered technique of choice when the displacement of mucosa is minimal. Preliminary impressions are taken in stock trays using low-viscosity alginate after 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.

Controlled lateral pressure technique[11]

Here, a green stick compound is used to record the denture bearing area using a correctly extended special tray. Greenstick compound overlying the fibrous tissues is gently removed using an instrument which is preheated. The tray is perforated in this region. Light bodied silicone impression material is then introduced onto the buccal and lingual aspects of the greenstick inserted. The excess material gets removed through the perforations, thus letting the fibrous ridge to adapt to the central position having been subjected to even lateral pressures.

III. Discussion:

A denture can have enormous impact on the psychology of the patient. Therefore it is of utmost importance that the treatment should be planned taking into consideration all the important parameters and the most suitable techniques are administered while treating the patient. As William Filler says,' Every edentulous patient who presents himself for complete denture treatment should be assessed in the context of his previous denture experience and the reason for seeking treatment at this time, his past and present medical history, his arch form, vault form, tongue habits, soft tissue conditions, throat form, muscle tone, mental attitude, and radiographic findings'. This information will enable the dentist to formulate an optimal treatment plan and facilitate the construction of complete dentures. In Modified William Filler's technique, light body condensation silicone is used instead of impression plaster paint. The main advantages of using light body impression material are minimal pressure to the tissues, better flow, better reproduction of details and less time consuming. In Zafrulla Khan technique, a window is created in the custom tray at the sight of unsupported flabby tissues. The unsupported flabby tissue portion is recorded using impression plaster while rest is recorded using Permalastic. The advantage that this technique possesses over Osborne and filler technique is that it does not require two sets of trays, hence is easier to use thus saving the chair side time of the operator and also enables visualization of impression making of the unsupported tissues. Hobkirk's technique uses a single custom tray thus avoiding excessive clinical procedures, It is easy to perform for the operator as well as the patients and causes minimal displacement of flabby tissues thereby increasing the stability of the denture. Split technique by Allan Mack's splint technique can be employed for excessively flabby ridges. Jone D. Walter recorded the healthy denture bearing tissues with zinc oxide eugenol paste and the displaced fibers of tissue with impression plaster. Modified fluid wax technique is easy to perform and has a lot of advantages over other techniques giving good working time to the operator. The impressions taking using this technique can be easily corrected and can gain maximum coverage. It accurately determines the extent of the muccobuccal reflections and can be used to direct pressure to the load-bearing areas of the jaw.

IV. Conclusion:

Management of flabby ridges can be a tedious task .It is important to select appropriate procedure and technique which can correctly cater to patients condition and suitable for the operator. Therefore accurate preoperative evaluation, diagnosis and treatment planning should be employed to achieve the best and the most desirable outcome.

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 71, 937–951, doi: 10.3109/00016357.2012.734421 (2013).
[2]. Peltzer, K. et al. Prevalence of loss of all teeth (edentulism) and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa. International journal of environmental research and public health 11, 11308–11324, doi: 10.3390/ ijerph111111308 (2014).
[3]. Essentials of complete denture prosthodontics; ??Edition; Sheldon Winkler.
[4]. Chakravarthy K Tomar SS, Tandan P, Modi R. Managing flabby tissue with different impression techniques: a case series. IJOCR 2015; 3(2):95-99
[5]. Singh DK, Dable R, Tandon P, Jain A. Prosthodontics rehabilitation of a maxillary fibrous ridge- A case report. TMU J. Dent. 2014; 1(4):164-67.

[6]. Khan Z, Jaggers JH, Shay JS. Impressions of unsupported movable tissues. J Am Dent Assoc. 1981 Oct;103(4):590-2.
[7]. Wee AG, Cwynar RB, Cheng AC. Utilization of neutral zone technique for a maxillofacial patient. J Prosthodont 2000; 9:2-7
[8]. Goodcare CJ, Kan JYK, Rungcharassaeng K. Clinical complications of osseointegrated implants. J Prosthet Dent 1999; 81:537-52
[9]. Gunnar E, Carlsson et al. Clinical morbidity and sequalae of treatment with complete dentures. J Prosthet Dent 1997; 79:17-23.
[10]. Tan KM, Singer MT, Masri R, Driscoll CF. Modified fluid wax impression for a severely resorbed edentulous mandibular ridge. J Prosthet Dent. 2009 Apr; 101(4):279-82.
[11]. Allen PF, McCarthy S. Complete dentures: From planning to problem solving. London: Quintessence. 2003;48–51.

Dr. Chandan R. Sengupta, et. al. "Prosthodontic management of Flabby ridges using effective Impression techniques." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(11), 2021, pp. 50-54.