Research Paper

Fabrication of Complete Dentures for A Patient with Resorbed Mandibular Anterior Ridge Using All Green Technique.

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ABSTRACT: The loose and unstable lower complete denture is one of the most common problems faced by denture patients with highly resorbed ridge. The management of such highly resorbed ridges has always posed a difficulty to the prosthodontist. Obtaining consistent mandibular denture stability has long been a challenge for dental profession. The simplest approach often is to extend the denture base adequately for proper use of all available tissues. To achieve this goal impression of the resorbed mandibular ridge is very important. The objective is to develop a physiologic impression with maximum support of both hard and soft tissues. In such cases, an innovative technique of impression making by using a close fitting tray and an elastomeric impression material to make a proper impression to achieve maximum retention and stability. This article describes an impression technique used for highly resorbed mandibular ridge using an all green impression technique, to gain maximum retention and stability.

Keywords: Resorbed mandibular ridge, impression technique, all green impression technique.

I. INTRODUCTION

The management of highly resorbed ridge has always been a challenge to the prosthodontists. The alveolar bone resorption under complete lower denture is known to both, the clinician as well as complete denture user [1]. It is also accepted that the rate of resorption varies from person to person [2] this is because the rate of resorption is fast in the mandible than in the maxilla. Achieving maximum stability and retention may be of utmost importance for patients with atrophied mandibular residual ridges [3]. The impression technique plays the substantial role. A good impression plays an important role in the successful treatment in cases of resorbed mandibular ridges where there is inadequate tissue to fulfil the requirement of retention, stability and support [4]. An accurate impression is the foundation of a good functional prosthesis as it determines the retention and comfort of the prosthesis. Today's clinical techniques are an amalgamation of the original prosthodontic philosophies. A Dynamic impression technique were also proposed with the intent of maximizing support from underlying tissues. The changes in impression techniques can be attributed to evolution of newer impression materials and better understanding of underlying tissues. Long term edentulism and use of ill-fitting dentures result in severe resorption of edentulous ridges, making a definitive impression challenging. This paper presents a novel, cost effective technique for impressing a class IV edentulous ridge (Fig-1) with the intent of maximizing retention, stability, tissue support, without over compressing the tissues with the help of readily available dental materials.

Case Report

A 66 years old female patient reported to the department of Prosthodontics and crown and bridge, Dr Z.A Dental college Amu Aligarh with a chief complaint of loosening of lower denture. The patient was apparently ingood health and did not report any significant medical history.
Patient was a denture wearer but not satisfied with the prosthesis due to poor stability. On intraoral examination, a highly resorbed mandibular ridge was observed. There was no hypermobile tissue on palpation (Figure 1).

**Technique:**

1. As the mandibular alveolar ridge was severely resorbed and sulcus depth was very shallow. For proper recording of residual ridge, a preliminary impression was made using McCord's technique. [3 parts impression compound + 7 parts greenstick compound] in a metal stock tray. (Fig-2)
2. The Impression was washed and poured in impression plaster. Cast was retrieved and spacer wax extending from left canine to right canine region was adapted.
3. Custom impression tray was fabricated on the preliminary cast using self-cure acrylic resin (DP1-RR Cold cure acrylic repair material). Border extension of the tray was kept 2 mm short of the vestibules. (Fig-3)
4. Modeling plastic impression compound (greenstick) was softened by heating over the flame and loaded over intaglio surface of the special tray. After tempering the tray was seated over the denture bearing area, and the labial and buccal borders were molded. (Fig 4)
5. Green stick material was trimmed from crest of anterior ridge providing the required relief. (Fig-5)
6. After applying tray adhesive on the impression and tray borders and allowing it to dry (Universal tray adhesive Zhermack). Wash impression was made with light body polyvinyl siloxane (ExpressTM VPS impression material light body regular set). (Fig 6)
7. After this denture was fabricated using conventional denture fabrication methods and denture was delivered. (Fig 7). Patient was recalled for follow up at 24 hours, 1 week and one month interval. Patient was happy with the denture and her complaint of loose lower denture was no more.

![Fig.1 intra oral view](image1)

![Fig.2 preliminary impression](image2)
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Fig 3. Special tray with spacer wax adapted on resorbed anterior area

Fig.4 All green impression

Fig.5 Scrapping of border molding compound at resorbed area

Fig.6 Final wash impression with light body addition silicon
II. DISCUSSION

The problems associated with class IV mandibular ridge are many, most evident being the frustration of the patient due to lack of retention of denture. Osseo integrated dental implants have emerged as the "gold standard" for treating edentulous patients as they provide a unique option of complete rehabilitation. However, they come with their own restrictions; notably cost and surgical risk. Implants in resorbed ridges have high surgical risk complications due to the need of regenerative techniques to improve the foundation for implants. Medical, social problems, in addition to cost factor may contraindicate autogenous bone transplantation. Therefore, conventional dentures still remain as a viable solution for majority of the ageing population. The impression of the completely edentulous arch is the single most contributing factor towards achieving retention, stability and support. Modifications of impression techniques have been tried in the past with a view of maximizing retention, stability and support of the denture. The primary impression should fulfill the objectives of retention, stability and also provide functional support which is of paramount importance in resorbed ridges in order to preserve the ridges. Soft tissues have varying degrees of displacement. They can be placed within physiological limit up to 2-2.5mm without undergoing compressive trauma. The tissues in the buccal shelf of the mandibular ridge do not resorb to the same extent as the anterior mandible as it is covered with dense cortical bone, it is usually at right angles to the occlusal plane and to the vertical occlusal forces. The impression technique takes into consideration the varying histological characteristics of the soft and hard tissues in the mandible. The focus is on primary impression, spacer design, secondary impression and the choice of impression materials. The primary impression in this technique makes use of low-fusing green stick that is less viscous than impression compound and does not over compress the tissues as the latter does. It also possesses better flow and handling characteristics and records accurate details. The histological characteristics of the tissues that cover the residual alveolar bone, the nature of the residual ridge bone, and its positional relationship to the direction of stresses that will be placed on it determine the spacer design. Spacer wax was adapted in the anterior region. Custom tray provides adequate space for the impression material, records functional form of the primary stress-bearing area and anatomic form of the area that cannot withstand functional loading. This helps in development of denture bases that exert additional pressure on primary stress bearing area when functionally loaded and relieve the areas not able to withstand the stresses. The goal is achieved by restricting the flow of...
impression material in the primary stress bearing area and scraping out the material from other areas. In this technique, green stick compound was used for border molding. It is a viscous material with low flow characteristics (70% at 45°C) and when placed in a closed confined, it causes tissue placement without compression. There is no finger pressure exerted on any part of the tray. Tray is held by placing 2 fingers on the tray in the buccal shelf area and the thumb supporting the chin. Final impression was made by light body polyvinyl siloxane providing accurate recording of the ridge as it applies lowest pressure during impression making procedure and provides excellent record of minute details of the residual ridge in its passive form. The space for the elastomeric material is provided by scraping off the compound from the intaglio surface of the impression except the buccal shelf area. This makes it a true functional recording of the edentulous jaws. Close adaptation to basal tissues ensures maximum retention, stability, and support. An alternative to the use of elastomeric body material is fluid wax. However, greater convenience, better handling and flow characteristics make light body a preferable choice.

Summary and Conclusion:
The presented procedure describes a simple, quick and reliable technique to impress the resorbed mandibular ridge using a custom tray, green stick compound and elastomeric impression material. Area to be relieved, namely the crest of the ridge, is impressed in anatomic form and the primary stress-bearing area is recorded in its functional form ensuring a healthy state of the tissues for extended periods. This technique combines both traditional and contemporary methods and the amalgamation leads to prosthesis with better retention and stability. Use of a viscous material in a close fitting tray allows physiological compression of tissues in the primary stress bearing areas. Elastomeric impression material helps in recording finer details of the ridge. Thus this technique helps in maximizing the functional support from the edentulous ridge. Due consideration is given to histological characteristics of the tissues and ensures the preservation of the residual alveolar ridge, thereby fulfilling all the objectives of impression making. Furthermore, readily available dental materials were used making this technique easy to adapt and master. As it is a new technique, its usefulness and relevance needs to be evaluated further. Patient education is mandatory prior to and following the treatment as Patient must understand the limitations of denture performance prior to the treatment.

REFERENCES

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