



## Prosthodontic Management of Severely Resorbed Mandibular Ridge Using Modified Impression Technique: A Case Report

### KEYWORDS

Complete Denture, Residual Ridge Resorption, Ridge atrophy

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**ABSTRACT** Complete denture treatment for edentulous patients is an age old form of dental treatment. Ridge atrophy presents a clinical challenge towards the fabrication of a successful prosthesis. Extreme resorption of the maxillary and mandibular denture bearing areas results in sunken and wrinkled appearance of cheeks, unstable and non retentive dentures with resultant pain and discomfort. The loose and unstable lower complete denture is one of the most common problems faced by denture patients. Prosthodontic management of severely resorbed mandibular ridge in an edentulous patient using modified impression technique in denture fabrication is presented.

### INTRODUCTION

Complete dentures are primarily mechanical devices but they must be fabricated in a manner so that they are in harmony with the neuromuscular functions of the oral cavity. All oral functions such as speech, mastication, swallowing, smiling and laughing involve the synergistic actions of the tongue, lips, cheeks and floor of the mouth which are very complex and highly individual.<sup>1</sup> The wearing of complete dentures may have adverse effects on the health of both oral and denture supporting tissues.<sup>2</sup> Residual ridge resorption is a complex biophysical process and a common occurrence following extraction of teeth. Ridge atrophy is most dramatic during the first year after tooth loss followed by a slower but more progressive rate of resorption thereafter.<sup>3,4</sup>

### CAUSES OF RESIDUAL RIDGE RESORPTION

A combination of multiple factors contribute to bone resorption but the amount of resorption and the relative importance of each factor varies with the patient. The etiologic agents believed to be of significance include (1) nutritional inadequacy of the diet, (2) endocrine functions, (3) tissue resistance to stress, (4) traumatic factors (dentures etc.), (5) systemic diseases and (6) disuse. The influence of genetic factors has not been investigated exactly. Inadequate dentures do not necessarily cause residual ridge changes in otherwise healthy individuals.<sup>5</sup> The ridge resorption cannot be controlled completely by ideal prosthetic procedure in a patient in whom systemic disease or pathologic conditions of the denture-bearing tissues exist. Local destruction of bone by periodontal disease before tooth extraction, improper surgical procedures of alveolar bone at the time of extraction of teeth or lack of follow-up and proper correction of changing tissue conditions may be contributing factors.

The key to successful complete denture therapy lies in precise execution of the treatment plan formulated by evaluation of a complete comprehensive history and thorough examination. Such a treatment is based on DeVan's principle of preservation of what already exists than the mere replacement of what is missing.<sup>6</sup> Treatment of atrophied ridges is a clinical challenge faced by dentists worldwide. Severely resorbed ridges present difficulty in fabrication of an adequate prosthesis.<sup>7</sup> This article presents prosthodontic rehabilitation of a patient with severely resorbed mandibular residual ridge.

### CASE REPORT

An 80 years old male patient presented with the chief complaint of difficulty in mastication, loosening of upper and lower dentures and poor esthetics for the past 4-5 years. He also complained of denture moving during swallowing and speaking.

On intraoral examination, mandibular ridge was severely resorbed. There was no hypermobile tissue on palpation. (Fig1)



Fig1. Mandibular resorbed ridge.

The patient was informed of all the options available for the treatment and treatment chosen was esthetically and functionally viable for him. The modified clinical approach for fabrication of denture was adopted for the fabrication of complete denture which had good retention, stability and esthetics for the patient.

### CLINICAL PROCEDURE

The primary impressions were made using impression compound. Maxillary custom tray was fabricated using a partial spacer design. Mandibular custom tray was fabricated without spacer unlike conventional impression technique. Maxillary final impression was made using light body addition silicone impression material after doing single step border

molding using polyether impression material. (Fig 2)



**Fig 2. Maxillary secondary impression.**

Mandibular border molding was done using low fusing impression compound (green stick) by placing green stick compound on the ridge portion and borders and then doing lip and cheek movements for border molding. After completion of border molding, extra material was scraped with the help of a scalpel. (Fig 3)



**Fig 3. Mandibular border molding done with Green stick.**

The final impression was made with zinc oxide eugenol impression paste. (Fig 4)



**Fig 4. Mandibular final impression.**

Then jaw relations were recorded and final prosthesis fabrication was done after wax try-in.



**Fig 6. Post-operative extraoral view**

Dentures were checked for occlusion and adequate extensions in the vestibule. The required adjustments required were done. The patient was reviewed after a week and minor denture related complaints were corrected.

#### DISCUSSION

The residual alveolar ridge consists of denture-bearing mucosa, submucosa, periosteum and underlying alveolar bone. Residual bone is that part of alveolar ridge which remains after the teeth have been lost. After the loss of teeth, the alveoli that contained roots are filled with new bone. This alveolar process becomes the residual ridge which is the foundation for the denture. The mean denture-bearing area of mandible is 12.25 cm<sup>2</sup>. Severe ridge resorption results in increased inter-arch space, unstable and non retentive mandibular dentures with inability to withstand the masticatory forces. The negative effects of ridge atrophy were managed by modifying the conventional procedures of fabricating a complete denture.<sup>8</sup> Various clinical techniques have been used to improve support, retention, and stability of the lower denture.

In the present case, the maximal contact between mucous membrane and denture base, and intimate contact of denture base and basal seat area was used. Retention was improved by using modified impression technique. The closely adapted complete denture was given in order to increase the patient acceptance and adequate function of the prosthesis.

#### CONCLUSION

Prosthetic rehabilitation of a patient with compromised edentulous ridges in a conventional manner is a difficult task. Modifications in the treatment procedures should be considered to fulfill the patient's functional and esthetic demands. A complete denture fabricated using modified impression procedures to ensure broad and intimate coverage of denture foundation can be given to a patient with severe ridge atrophy and increased inter-arch space.

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