



## An Innovative Wire Impression Technique of Highly Resorbed Mandibular Ridge

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### Abstract

Managing the highly resorbed mandibular ridge is a challenging job. Rehabilitation of a completely edentulous patient using a conventional complete removable denture is a routine clinical procedure, yet at times it can be a difficult and challenging one. Making an impression with available stock trays, even after modification is difficult in case of extremely resorbed ridges. In such cases, an innovative technique of making impression with properly adapted wire and silicone putty can be used to make a proper impression to achieve maximum retention and stability. This article describes an impression technique of highly resorbed mandibular ridge using an orthodontic wire, to gain maximum retention and stability.

**Keywords:** Resorbed mandibular ridge; Impression technique; Orthodontic wire

### Introduction

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 [1,2]. Severely atrophied ridges are a more common finding with the mandibular residual ridges than the maxilla. This is because the mandible resorbs at a faster rate than the maxilla. Achieving maximum stability and retention may be especially important for older patients with atrophied mandibular residual ridges [3]. The impression technique plays the key role. A good impression holds the key to a successful treatment in cases of resorbed mandibular ridges where we have minimum tissue to fulfil the fundamental requirement of retention, stability and support. No matter how good the prosthesis is constructed, it will not function as intended if it was not made on an accurate impression. The impression determines the retention and comfort of dentures made for patients with unfavorable residual ridges [4]. Minimum bone height, unfavourable residual ridge morphology, and/or muscle attachments make the situation more challenging [5].

This article describes an impression technique of highly resorbed mandibular ridge using an orthodontic wire and elastomeric impression materials, to gain maximum retention and stability.

### Case Presentation

A 64 years old female patient reported to the department of Prosthodontics and crown & bridge, Institute of dental studies and technology, Kadrabad with a chief complaint of loosening of lower denture. Medical history was insignificant. The patient was apparently in good health and did not report any systemic disease. 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. A primary mandibular impression was made using patient's previous denture with irreversible hydrocolloid impression material (Vignette Chromatic, Dentsply, India). A primary mandibular cast was made using dental plaster (Dentico, Neelkanth, India).
2. A 19 gauge wire (S.S smith) was adapted on the mandibular ridge on the primary cast in the form of special tray. An orthodontic wire was used to make a loop with the help of universal plier, which extended from one retromolar pad to other covering the crest of the ridge. A handle was fabricated with the same wire. The special tray was checked in the patient's mouth (Figure 2).
3. The primary impression was made with putty consistency of polyvinyl siloxane (Photosil,

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Figure 1: A highly resorbed mandibular ridge (intraorally).



Figure 2: Special tray fabricated with orthodontic wire checked in the patient's mouth.



Figure 3: Final impression made using polyvinyl siloxane (3M ESPE, Seefeld, Germany) elastomeric impression material.

DPI, India) by mixing equal proportion of base and catalyst. The mixed impression material was loaded on wire and primary impression was made. Any deficiencies were rectified by addition of putty in deficient areas.

4. After completion of border moulding, a flame shaped carbide bur was used to trim the putty to make space for the final impression material. Final impression was made using addition silicone (3M ESPE, Seefeld, Germany) elastomeric impression material of light body consistency (Figure 3).

5. Master cast was poured using die stone (Elite Rock, Zhermack) (Figure 4).

6. After this denture was fabricated using conventional denture fabrication procedures and denture was delivered. (Figure 5). Patient was recalled for follow up at 24 hrs 1 week and 1 month interval. He was quite happy with the denture and his complaint of loose denture was no more.

## Discussion

In the atrophic mandible, one of the principle functional



Figure 4: Master cast poured using die stone (Elite Rock, Zhermack).



Figure 5: Final prosthesis (complete denture) in occlusion.

problems, other than instability, arises from the inability of the residual ridge and its overlying tissues to withstand masticatory forces. Furthermore, the muscle attachments are located near the crest of the ridge, with greater dislocating effect of the muscles. For these reasons, the range of muscle action, as well as spaces into which the denture can be extended without dislocation, must be accurately recorded in the impression. Customized tray that is fabricated in this technique has the advantage of avoidance of dislocating effect of the muscles on improperly extended denture borders. The addition silicone used in border moulding is easy to handle and can be repeatedly moulded. Multiple casts can be poured with the same impression material.

Due to the anatomical differences between the maxilla and the mandible, as well as the differences in primary and secondary load-bearing areas, impressions of resorbed mandibular ridges require special considerations [6]. Mandibular residual ridges with adequate bone support can usually be precisely recorded with conventional impression techniques using materials such as zinc oxide eugenol (ZOE) or elastomeric impression materials because of the inherent accuracy of these materials and their propensity to distribute pressure equally [7]. A number of modified impression techniques for resorbed mandibular ridge have been suggested by various authors such as admixed [8], functional [9], all green [10], and cocktail technique. The modified functional impression technique seems to be a logical option for the management of compromised mandibular ridges. Tan et al advocated the use of a functional impression using fluid wax [11]. Use of elastomers has been described in the past and presents several advantages, including fewer insertions, less difficulty, greater time efficiency, and reduced patient discomfort compared to those made with compound [12,13].

The purpose of this article is to describe a customized wire stock tray system that may be helpful for making impression for patients with highly resorbed mandibular ridge. The tray is easy to fabricate

and can be easily moulded according to the shape and size of the residual ridge.

## Conclusion

The basic objective of maxillary or mandibular impression is to record all the potential denture bearing surface available. For fabrication of a successful complete denture it is the prosthodontist's duty to select proper impression technique to be used for particular ridge form. This article provides a novel approach in the management of completely edentulous patient with mandibular resorbed ridge. The technique described here is simple which utilizes routine materials used for denture fabrication.

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