

## **ENHANCING RETENTION AND STABILITY IN A SEVERELY RESORBED RIDGE: A CASE REPORT**

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### **ABSTRACT:**

Complete dentures serve the purpose of mastication, esthetics and phonetics. Success of the complete denture prosthesis relies on the factors of retention, stability and support. Rehabilitation of completely edentulous patients becomes more challenging as the residual ridge resorption increases. Recording of the available denture bearing area for the prosthesis is utmost important and many techniques of impression making have been described in the past. The present case report describes a modification of functional impression technique in severely resorbed mandibular ridge for the fabrication of complete denture prosthesis.

**Keywords:** Severely resorbed ridges, Functional impression technique, Closed mouth impression, Winkler's technique, Tissue conditioner



### **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.<sup>[1]</sup> As the ridge resorption increases the available denture bearing area becomes less and obtaining adequate retention and stability is difficult. Therefore, the impression technique needs to be modified. A number of modified impression techniques for resorbed mandibular ridge have been suggested by various authors such as admixed, functional, all green, and cocktail technique.<sup>[2-7]</sup> The following case report

describes the management of severely resorbed mandibular ridge with a modification of Winkler's functional impression technique, thereby enhancing the retention, stability and support of complete dentures.

### **CASE DETAIL:**

A 46 year old female patient reported to the Department of Prosthodontics, College of Dental Sciences, Davangere, Karnataka, with the chief complaint of loose lower complete denture and desiring a new prosthesis. The patient was unable to chew or speak properly as the dentures were not stable in their position. Patient gave a history of being a denture wearer since the past ten years. Medical history revealed no underlying

systemic disorder. On examination the patient presented with completely edentulous maxillary and mandibular arches, mucosa being healthy, firm and resilient. The mandibular ridge was severely resorbed (fig 1 and 2).

After thorough clinical examination and evaluation of the radiographs, various treatment options were discussed, which included oral surgical procedure to improve the mandibular ridge followed by implant supported prosthesis or conventional complete denture. Due to the reasons of increased cost and multiple appointments, patient opted for conventional complete denture treatment.

Primary impressions were made using impression compound and casts were poured. Custom trays were fabricated using auto polymerizing resin. Border moulding was done with Type II compound (low fusing) and final impressions were made using zinc oxide eugenol impression material, followed by pouring of master casts using dental stone. Mandibular denture base was made using auto-polymerizing resin. Occlusal surface of the patient's old mandibular denture was duplicated using putty and clear auto-polymerizing resin (fig 3). This occlusal unit of old denture was luted to the newly fabricated mandibular denture base with the help of auto-polymerizing resin and a temporary mandibular denture was fabricated (fig 4). Occlusal adjustments were made and given to the patient after the application of three coats of tissue conditioner.

Patient was asked to wear the denture and perform the functional activities.

Patient was recalled after 2 days and the mandibular denture was procured. Without disturbing the impression recorded by tissue conditioner (fig 5), a cast was poured. Maxillary and mandibular denture bases and occlusal rims were fabricated. Jaw relation was recorded and teeth arrangement followed by try-in was done. Conventional method of packing and curing was followed and denture was given to the patient (fig 6 and 7). During the recall visits, patient was satisfied with the improved retention and stability (fig 8).

#### DISCUSSION:

The success of every complete denture relies on the fulfilment of the three basic properties of retention, stability, and support.<sup>[2]</sup> As the duration of edentulism increases, residual ridge resorption also increases, thereby making the fabrication of complete dentures difficult.

Many impression techniques have been described in the literature for the management of resorbed ridge such as admixed, functional, all green, and cocktail techniques. Functional impression technique was advocated by Winkler and he suggested the use of tissue conditioner as a material for final impression.

Tissue-conditioning materials are soft, resilient, temporary relining materials which, by reducing and evenly distributing stresses on the mucosa of

the basal seat, have a rehabilitating effect on unhealthy tissue and allow reversible conditions to return to normal states of health.<sup>[8]</sup>

In the present case, primary impressions were made and casts were poured. Custom trays were fabricated followed by border moulding, final impressions and master casts were poured. On the mandibular master cast, a denture base was fabricated. Occlusal unit duplicated by patient's old denture was luted to this denture base and a temporary mandibular denture was made. The intaglio surface of this temporary denture was coated with tissue conditioner and the patient was asked to perform functional movements. After two days, the impression recorded in temporary denture was procured and cast was carefully poured. Maxillary and mandibular denture bases and occlusal rims were made, followed by jaw relation, teeth arrangement. Packing and curing were done in conventional manner and dentures were given to the patient. During recall visits, patient was happy with the improved retention and stability.

Winkler advocated recording the functional movements in chair side using

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occlusal rims where dentist has no control over patient movement, which may result in under- or over-extended borders. Tongue is restricted to move anteriorly which may alter the anatomy of lingual border.

The advantages of the present technique are that mandibular border moulding was performed and the temporary denture fabricated on the master cast, which reduced the chances of over-extended impression border with the tissue conditioner. Also, temporary denture helped the patient to perform better functional movements and tongue movement was not restricted so that the extension of lingual sulcus was recorded properly.

#### CONCLUSION:

The present case report describes the use of tissue conditioner as a functional impression material. Functional recording of the denture bearing area resulted in good retention, stability and support for the prosthesis. This technique can be advocated in old denture wearers and in atrophic mandible conditions.

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#### FIGURES:



Fig 1: completely edentulous maxillary ridge



Fig 2: completely edentulous resorbed mandibular ridge



Fig 3: occlusal unit



Fig 4: Temporary denture made with auto-polymerizing resin



Fig 5: Final impression recorded using tissue conditioner



Fig 6: Postoperative maxillary occlusal view



Fig 7: Postoperative mandibular occlusal view



Fig 8: Postoperative view

