Improving Success Rate with Increased Weight of Denture for Poorly Resorbed Mandibular Ridge Patients: A Case Report Series

Parikshit Gupt*, Vishal Katna, Archana Nagpal, Kamal Kishore Kashyap and Surbhi Abrol
Department of Prosthodontics, Himachal Dental College, India

Abstract
Added weight to mandibular denture is an easy and effective way in enhancing the retention and stability of the mandibular denture for efficient functioning. A case series of such resorbed ridge cases treated by adding weight using cast metal with its precise placement without altering the esthetics is described in this article.

Introduction
Resorbed mandibular ridge cases always present a clinical problem for their stability and retention due to lack of bone height needed for stabilization from horizontal forces. With the continued resorption of bone, the ridge is under the influence of functional musculature movements which can easily dislodge the denture [1].

Instability and discomfort in conventional denture is attributed to the degree of resorption of mandibular alveolar ridge. This condition can be managed by various surgical treatment options like implantation, augmentation or vestibuloplasty. Certain situations may not allow the clinician for surgical interventions, because of either patient’s medical conditions, affordability or patient’s personal preference. To deal with such scenario with patient’s constrains and deficient foundation area, a stable, strong and functional mandibular denture can be fabricated by alterations in its fabrication, that may include modification in either impression making, jaw relation, teeth selection and setting or alteration in designing of the denture.

One alteration in designing of the denture is to increase its weight to aid in its stabilization and retention, by the effect of gravity. The idea of increased weight of mandibular denture to provide stability is not new. It was introduced by Grunewald [2], where he used gold as a metal denture base to increase the weight and suggested that mandibular denture base weighing 32 gms is effective for achieving satisfactory retention.

Belfiglio et al. [3] and Wormley et al. [4], have described various techniques to increase weight of the denture by fabricating a metal base dentures. But metal based dentures have problems of adjustment, relining and irritation to the tissues. Massad et al. [5] described a technique to fabricate a metal base denture for highly resorbed mandibular ridge with a resilient liner. Hurtado et al. [6] also mentioned a technique to fabricate internally weighted denture.

Kim et al. [7] have described a method for fabricating a mandibular denture with increased weight by precisely locating the position of the cast metal in the denture by making a permanent heat cure denture base and securing the teeth arrangement in a plaster index. This design didn’t affect the esthetics of the denture and also provided an acrylic base which could be relined in future if required.

This article here presents the case report of three cases by use of internally weighted mandibular denture as described by Kim et al, to achieve successful results.

Case Presentation
Case 1
A completely edentulous, 55 year old male reported to the Department of Prosthodontics of Himachal Dental College Sunder Nagar, Himachal Pradesh, India, presented with mandibular edentulism and asked for a new set of artificial teeth. A thorough medical and dental examination
was done. Mandibular ridge was found to be of order 6 classified according to Atwood and maxillary anterior ridge was found to be flabby. Mandibular ridge was so severely resorbed that buccal and lingual vestibule and crest of the ridge, all were found a same level. Patient was also diabetic. Treatment planned was fabrication maxillary denture with relief for flabby ridge and internally weighted mandibular denture with closed mouth impression technique (Figure 1A and 1B).

**Case 2**

A 65-year-old completely edentulous female reported to the Department of Prosthodontics of Himachal Dental College, Sunder Nagar, Himachal Pradesh, India who was using her 10 year old dentures but was not able to chew food efficiently and wanted to get a new set of denture. Mandibular ridge was found to be of order 6 classified according to Atwood classification. Mandibular denture was planned to be designed with increase weight using cast metal with conventional maxillary denture (Figure 2A and 2B).

**Case 3**

A 70-year-old completely edentulous female reported to the Department of Prosthodontics of Himachal Dental College, Sunder Nagar, Himachal Pradesh, India with her old dentures to be repaired. However, the condition of the denture base was poor with attrited teeth. So a new denture was advised. Intro oral examination revealed severely resorbed mandibular ridge of order 6. Mandibular impression was made by closed mouth technique and an internally weighted cast metal denture was fabricated with conventional maxillary denture (Figure 3A and 3B).

**Discussion**

An internally weighted mandibular denture in one of the non-invasive treatment option indicated for severely resorbed mandibular ridge cases, which provide stability retention and function to the mandibular denture without altering the esthetics of the dentures. It is possible only by the accurate and precise placement of the internal cast metal structure with a calculated weight. Various methods described in literature by authors gave an idea about the amount weight to be added to the denture for gravity to be effective and the techniques for inclusion of metal into the denture. But the technique of incorporating the cast metal is the most effective and accurate among all, and it also gives an option to for relining or rebasing if needed in future.

Checking for the sufficient clearance for cast metal is easy in this design by preparation of a plaster index that secures the teeth arrangement (Figure 4A,B,C and 4D). This design allows visualizing the placement of cast metal accurately in the denture by fabrication of permanent heat cure denture base with slot for its placement, which will prevent the dislodgment of or exposure of cast metal which is always a problem when using amalgam pellets for increased weight (Figure 5A and 5B).

The only disadvantage is the increase in laboratory steps and the cost, but this is negligible compared to its advantages and worth.

However, such increased weight dentures are not indicated for the patients with weak labial musculature or those who stoop. In bent position, the weight of denture will make it to fall out of the mouth.

**Conclusion**

Increased weight of mandibular denture is an easy and convenient
method of dealing with highly resorbed ridge case and should be considered before taking up the invasive surgical procedures that have unpredictable results.

References