

# Internally Weighted Mandibular Denture: A Case Report

Ahzam Shaikh<sup>1</sup>, Smita A. Khalikar<sup>2</sup>, S.P. Dange<sup>3</sup>, Arun Khalikar<sup>2</sup>

## ABSTRACT

**Introduction:** Severely resorbed residual alveolar ridges pose a clinical challenge during prosthodontic rehabilitation. Residual ridge resorption leads to a decrease in denture bearing area which in turn will lead to a decrease in retention, stability and support of the planned complete denture prosthesis. Various treatment options have been described for rehabilitation of patients with a severely resorbed ridge.

**Case Report:** This article reports a case of severely resorbed anterior mandibular ridge for which an internally weighted mandibular denture was fabricated with a customized weighted metal base using putty index of the tooth arrangement as a guide.

**Conclusion:** In cases of severely resorbed ridges, reinforcement of the denture with a customized metal framework with minimal metal display is an optimal treatment alternative to achieve the desired esthetic and functional outcome.

**Keywords:** Framework, Internally weighted, metal base, reinforce, resorbed ridge,

## INTRODUCTION

Metal bases and frame-works have been known for their use in reinforcing the mandibular denture base while managing unfavourable resorbed ridges. They improve the fracture resistance, dimensional stability, accuracy, weight and retention of the denture bases. Grunewald<sup>1</sup> introduced gold framework to compensate for the weight lost after tooth extraction and extensive resorption in resorbed mandibular residual ridges. Belfiglio<sup>2</sup> also advocated the use of metal bases to reinforce the complete dentures when a higher degree of dimensional change is expected during processing or when an increase in strength is needed. DeFurio and Gehl<sup>3</sup> described the use of chrome-cobalt as one of the most retentive base material for the foundation of maxillary complete dentures. Although the use of metal base dentures reinforced the prosthesis, they often irritate the underlying alveolar ridge and the post-delivery intaglio surface adjustments are difficult.<sup>4</sup> To overcome these disadvantages of a metal denture base, different authors have described different techniques to position and fabricate the internal metal bases during denture processing. Wormley and Brunton<sup>5</sup> described a technique to fabricate internally weighted mandibular dentures by molding softened sticks of wax into a triangular cross-section shape directly over the definitive cast to fabricate a metal bar. They incorporated plastic sprues projecting laterally at the facial and lingual sides of the wax pattern in a tripod configuration to suspend the metal bar during the denture processing. The technique reported by Hurtado<sup>6</sup>, consisted of fabricating a weighted metal base by using 4 cast metal tissue stops similar to the cast stops of distal extension partial removable prostheses. Kim et al<sup>7</sup> described a method for fabricating an internally weighted mandibular complete denture using a processed denture base and a plaster index of the preliminary tooth arrangement. The most recent technique described by Balch et al<sup>4</sup> described

the use of vertical posts extending from the framework into the definitive cast to maintain space beneath the framework during acrylic resin processing. The fabrication of internally weighted mandibular dentures requires accurate impressions and additional laboratory procedures while the cost of the alloys adds to the cost of the prosthesis. This article describes a case report wherein an internally weighted mandibular complete denture was fabricated with customized design and position of the metal base for an optimal esthetic and functional outcome and also allowed for conventional relining procedures.

## CASE REPORT

A male patient aged 69 years reported to the Department of Prosthodontics, Govt. dental College and Hospital with a chief complaint of broken lower denture. The patient gave a history of being a denture wearer for the past 3 years. He got his dentures replaced twice both times the reason being midline fracture of the lower dentures. Intraoral examination revealed that the anterior mandibular residual ridge was very severely resorbed as compared to the posterior residual ridge. The patient insisted on making a new set of dentures which won't get fractured. The patient was assessed and considered for an implant supported overdenture but due to the unwillingness of the patient to undergo any surgical procedures and age considerations it was decided to fabricate the mandibular denture reinforced with a metal framework.

A full-coverage preliminary mandibular impression was made by using stock impression trays and irreversible hydrocolloid. The maxillary final impression was made using a custom tray and zinc oxide eugenol impression paste and was poured in type 3 dental stone. As the mandibular ridge was severely resorbed anteriorly the lower impression was made using McCord's technique<sup>8</sup> (Figure-1). The occlusal vertical dimension was determined using trial bases with wax occlusion rims. Facebow record was then taken and the casts were mounted with the facebow and centric relation record. The trial dentures with denture teeth arranged were placed intraorally and evaluated clinically (Figure-1). The land area of the mandibular definitive cast was scored to make a putty index of the mandibular teeth arrangement. The mandibular master cast was duplicated onto which two sheets of modeling wax were adapted. Then as described by Graser<sup>9</sup> one sheet of wax was removed from the area which the metal framework would occupy. This was

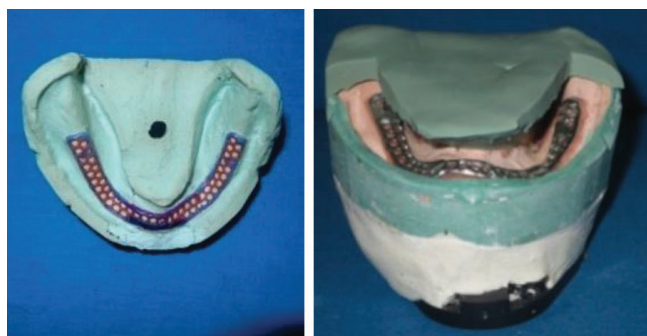
<sup>1</sup>P.G. Student, <sup>2</sup>Associate Professor, <sup>3</sup>Professor, Government Dental College and Hospital, Aurangabad, India

**Corresponding author:** Dr. Ahzam Shaikh, Room no. 231, Dept. of Prosthodontics, Ghati campus, Govt. Dental College and Hospital, Aurangabad, Maharashtra, India.

**How to cite this article:** Ahzam Shaikh, Smita A. Khalikar, S.P. Dange, Arun Khalikar. Internally weighted mandibular denture: a case report. International Journal of Contemporary Medical Research 2016;3(8):2448-2449.



**Figure-1:** (a) Maxillary and mandibular final impressions. Mandibular final impression was recorded using McCord's technique. (b) Wax trial of the denture



**Figure-2:** Wax pattern of the framework on the refractory cast; **Figure-3:** Metal framework fabricated using putty index of the teeth arrangement



**Figure-4:** (a) Intaglio surface of the processed denture, (b) Postoperative view of the patient

then again duplicated to make a refractory cast. Spacer wax was adapted on this refractory cast in the slot prepared for casting according to the indexed denture teeth to provide optimal base fit and improve the esthetic outcome (Figure-2 and 3). Sprues were then fixed and casting was done. The cast metal insert was then adapted over the first thickness of baseplate wax (adapted on the master cast). Figure-3 shows the space available for the teeth and denture base. The trial denture base with the cast metal insert adapted on the master cast was then processed with high impact heat-polymerized acrylic resin. The prosthesis was then retrieved and polished for insertion. Figure-4 shows the intaglio surface of the processed denture.

## DISCUSSION

Severe resorption of the mandibular alveolar ridge may sometimes bring the need to construct a mandibular denture that is strong, stable and functional which can be met by a denture reinforced with a metal framework. The inherent strength of such a denture make it possible to meet the patient's special needs. The internally weighted mandibular denture fabrication

described here was fabricated using a combination of Graser's<sup>9</sup> technique and a modification of Kims<sup>7</sup> technique. We used a putty index instead of the plaster index used by Kim et al. It allowed for adequate restorative space to permit relief of framework from the definitive cast as evaluated by the putty matrix of the trial denture base positioned on the master cast. One study demonstrated that mandibular complete denture fractures decreased following internal metal reinforcement as long as adequate bulk of acrylic resin was present.<sup>10</sup> If sections of the denture above the internally suspended framework are too thin for adequate thickness of acrylic resin, then the mandibular complete denture's cameo surface can be modified and finished in metal so that strength is not compromised. The internally suspended framework is also indicated when edentulous ridge contours are irregular or significantly compromised, because all denture base adjustments remain in acrylic resin rather than metal. A disadvantage to this or any complete denture reinforcing framework is the added expense of the prosthesis for the patient.<sup>4</sup>

## CONCLUSION

In cases of severely resorbed anterior mandibular ridge, the reinforcement of the denture by a customized metal framework well adapted to the ridge is an optimal treatment alternative. This reinforcement will aid in resisting fracture of the resulting denture. The fabrication technique described in this article will help in achieving appropriate contour of the denture base with minimal metal display and may benefit the patient when implant placement or pre-prosthetic surgery is not an option.

## REFERENCES

1. Grunewald AH. Gold base lower dentures. *J Prosthet Dent.* 1964;14:432-41.
2. Belfiglio EJ. Using metal bases in making complete dentures. *J Prosthet Dent.* 1987;58:314-7.
3. DeFurio A, Gehl DH. Clinical study on the retention of maxillary complete dentures with different base materials. *J Prosthet Dent.* 1970;23:374-80.
4. J. Heath Balch. Reinforcement of a mandibular complete denture with internal metal framework. *J Prosthet Dent.S* 2013;109:202-205.
5. JH, Brunton DA. Weighted mandibular dentures. *J Prosthet Dent.* 1974;32:101-2.
6. Hurtado AJ. Internally weighted mandibular dentures. *J Prosthet Dent.* 1988;60:122-3.
7. Kim H, Brewer JD, Monaco E. Internally weighted mandibular denture fabrication using a processed denture base. *J Prosthet Dent.* 2009;102:123-5.
8. J. F. McCord and A. A. Grant. Impression making. *British Dental Journal.* 2000;188:p484. 9p.
9. Graser GN. Completed bases for removable dentures. *J Prosthet Dent.* 1978;39:232-6.
10. Berry HH, Funk OJ. Vitallium strengthener to prevent lower denture breakage. *J Prosthet Dent.* 1971;26:532-6.

**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 19-06-2016; **Published online:** 31-07-2016