

## Case Report

### **Complete Denture with Metal Base-A Case Report**

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**Abstract:** The present case report deals with oral rehabilitation of completely edentulous maxillary and mandibular arches by incorporating metal denture base in place of the conventional Poly Methyl Methacrylate material to improve the longevity of the prosthetic replacement, at the same time prevent resorption of the underlying residual maxillary ridge. Successful complete denture use by patients depends on many variables, but three factors stand out in terms of functional success: retention, stability, and support. Of the three, it generally is agreed that stability is the most important factor. Metal bases are used to enhance these physical properties of complete dentures.

**Keywords:** Complete Dentures, Metal base, Polymer resins, Metal denture base.

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#### **INTRODUCTION**

According to French FA [1] artificial dentures function like mechanical machines in an anatomic environment. In cases where there is a clash between esthetic and functional requirements, a choice is to be made by favoring one at the expense of the other or make some amount of compromises in most of the situations.

Polymers are the dominant material for the fabrication of denture bases. Materials such as polymethyl methacrylate may be molded and polymerized by use of a variety of techniques. These polymeric bases present acceptable physical, biologic, and esthetic characteristics at moderate expense. However, there are instances in which these bases fail because of poor denture base adaptation. Failure may also be caused by excessive Masticatory forces when we fabricate single complete denture against the natural dentition. In those situations metal alloys have been used to strengthen the bases and prevent fracture [2].

Metals and metal alloys used in denture bases display excellent strength-to-volume ratios [3] and may be cast in thin sheets maintaining rigidity and fracture resistance. Thinner metallic denture bases decrease interference with phonation [4]. Metal bases also display desirable dimensional characteristics and may

be cast accurately [5]. High thermal conductivity also has been deemed a significant advantage and some practitioners feel that this characteristic is responsible for enhanced health of tissues in contact with metal bases [6].

The major disadvantages associated with metal denture bases include increased cost, difficulty in fabrication, compromised esthetic qualities, and inability to rebase such prostheses [7]. Nevertheless, they may be indicated when polymer-based systems fail to provide acceptable physical properties. The fabrication of metal denture bases is not complicated and not cost prohibitive when base metal alloys are used. To minimize weight, maximize strength, and ensure proper palatal contours, the resin-metal junction must be carefully positioned and sculpted. Failure to achieve unobtrusive palatal contours may produce noticeable changes in phonation [8]. This article describes fabrication of complete denture with metal base.

#### **CASE REPORT**

A 45-year-old female reported to the Department of Prosthodontics, Rama Dental College-Hospital & Research Centre, Kanpur with a chief complaint of inability to chew food due to missing teeth in the maxillary and mandibular arches (Figure 1).

Detailed case history was recorded and no significant medical concerns were observed.

The preliminary phases of metal base denture construction do not differ significantly from conventional resin-base techniques. Preliminary impressions of the edentulous maxilla and mandible were made with impression compound and plaster cast was poured for the fabrication of a custom special tray. The peripheral tracing procedures were completed with green stick impression compound and the secondary impression was made with zinc oxide eugenol impression material. Master cast was made with dental stone Type III (Figure 2) and the mould of the same was made with reversible hydrocolloid (Agar) and a refractory cast was poured with phosphate bonded investment material.

Trial denture bases and occlusion rims are fabricated, fitted, and adjusted. (Figure 3)

At this stage, jaw relation records are used to mount and verify the positions of maxillary and mandibular casts. (Figure 4)

After mounting on a mean value articulator, prosthetic teeth are arranged according to anatomic, functional, and esthetic guidelines. (Figure 5)

During a subsequent clinical appointments tooth arrangement is evaluated intraorally, esthetics and phonetics are evaluated. (Figure 6)

On the refractory cast the denture base pattern wax was adapted and the sprues were attached & invested. The denture base was casted with nickel - chromium metal. The denture base covered the palate and residual ridges in the maxillary cast and residual ridges on the mandibular cast with retentive loops extending on the ridges and the posterior palatal seal area for mechanical retention of acrylic resin and teeth to the metal. (Figure 7)

Then the dewaxing of the trial denture was done. The metal framework of the denture bases were placed on their respective casts, then proceed with the acrylization using heat cure denture base materials and trimming, finishing and polishing was done for maxillary and mandibular dentures with metal bases. (Figure 8,9 )

Then insertion of the maxillary and mandibular dentures with metal base was done and delivered to patient and instructions were given to the patients for the proper care and maintenance of the denture. (Figure 10)



**Fig-1:Pre-operative intraoral image.**



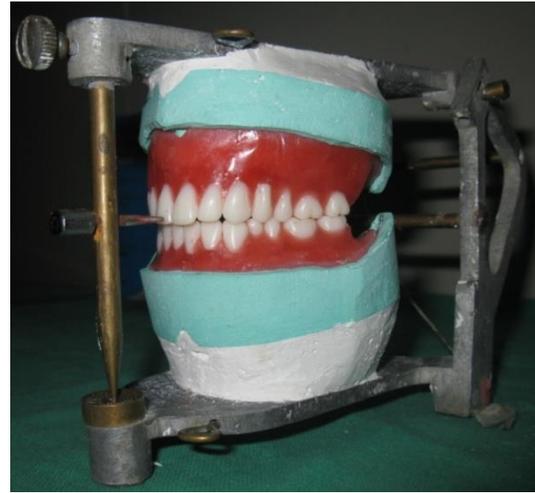
**Fig-2 : Maxillary and mandibular master casts**



**Fig-3: trial denture base and occlusion rims fabricated over master casts.**



**Fig-4: jaw relation recorded**



**Fig-5: Teeth arrangement**



**Fig-6: Try - in**



**Fig-7: Metal denture bases over maxillary and mandibular casts**



**Fig-8 : Polished maxillary and mandibular complete dentures with metallic bases**



**Fig-9: intaglio surfaces showing metallic bases.**



**Fig-10: Denture placement.**

## CONCLUSION

It is frequently desirable to construct a complete denture that is very thin in many areas. To make this denture using pink plastic (Poly Methyl Methacrylate material) would render the denture susceptible to fracture under normal functional forces expected in the mouth. The use of metal to construct such a denture permits the fabrication of a thin, yet strong prosthesis, achieving both comfort and durability for the patient. By incorporating metal into the denture, the weight of the denture is increased. The added weight of the metal-base lower denture may feel more natural for many patients. This additional weight may also contribute to lower denture stability.

Advantages of metal-base complete dentures:

1. Improved biocompatibility resulting in healthy appearing supporting tissues.
2. May be use with soft liners.
3. Provides added strength for easily broken dentures.
4. Improves the accuracy of fit to the supporting gum tissues.
5. Patients perceive a more natural feeling from the added weight.
6. Additional weight may contribute to improved denture stability.

Disadvantages of metal-base dentures:

1. It is rather difficult to reline metal-base dentures.
2. Increased cost of fabrication.

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