



**ORIGINAL RESEARCH PAPER**

**Dental Science**

**MANAGEMENT OF MAXILLARY SINGLE COMPLETE DENTURE WITH HIGH FRENAL ATTACHMENT - CASE REPORTS.**

**KEY WORDS:** Single complete denture, high frenal attachment, metal mesh, metallic denture base..

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**ABSTRACT** Single complete denture fabrication requires a complete understanding of the basics of prosthetic rehabilitation of the lost natural dentition which makes it a complex prosthesis and a difficult task for the prosthodontists. The single complete denture prosthesis might be opposed by a natural teeth, fixed restorations, a removable partial denture or an existing complete denture. This articles deals about two case reports with the oral rehabilitation of completely edentulous maxillary arch with high frenal attachment and opposing natural dentition in mandibular arch by incorporating metallic denture base and metal mesh into the denture base to combat the masticatory forces from the natural dentition and improve the longevity of the prosthesis.

**INTRODUCTION:**

De Van's statement that "Perpetual Preservation Of That What Remains Rather Than Meticulous Replacement Of What Has Been Lost."<sup>13</sup> is the main objective any prosthetic treatment is based on. It is especially true in terms of completely edentulous jaw opposing natural dentition and treatment planning in such conditions with single complete dentures needs critical evaluation of various factors.

Though the success of complete dentures depends on many factors , the three main factors for the functional success of the complete dentures depends are RETENTION, STABILITY and SUPPORT.

Polymers are the dominant material for the fabrication of denture bases. There are various methods in which the materials such as polymethyl methacrylate may be molded and polymerized. These denture bases made with polymers present acceptable physical, biologic, and esthetic characteristics at moderate expense. In certain situations 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.

The most common clinical situation involving a single complete denture is that of an edentulous maxillary arch with mandibular natural dentition where the edentulous arch is adversely affected because of the forces generated<sup>3</sup>. The natural teeth can resist or deliver greater magnitude of the force without discomfort or displacement. There might be occlusal stress from the forces of the opposing natural dentition and musculature on the maxillary denture and the underlying edentulous tissue. The flexural fatigue resulting from opposing natural dentition often results in the midline fracture in the denture.

Several methods to increase the resistance of denture base to mechanical stress are available. Acrylic resin base reinforced with several types of fibres such as carbon, aramid, woven polyethylene and glass fibres have been introduced in past, but they all have certain disadvantages<sup>5</sup>.

The presence of high frenal attachment leads to deep incisal notches which represents a point of weakness that might act as a

stress raiser and that contributes to fracture. Due to the deep labial frenal notch midline fracture was observed. Once a crack is initiated in the anterior midline of the polished surface, the tensile forces tend to open the crack and cause a fracture.

This article explains two case reports where maxillary single complete denture was fabricated preventing the midline fracture.

**CASE REPORT 1:**

A 55 years female patient reported to department of prosthodontics ,CSICDSR with a complaint of missing teeth in the upper arch with difficulty in mastication and unesthetic appearance. On intra oral examination revealed completely edentulous maxillary arch with high frenal attachment and opposing natural dentition in the mandibular arch and grade 1 mobility in relation to 31,41 and occlusal plane altered (Figure 1).

Patient planned for metallic denture base in the maxillary arch. The following steps where followed in the procedure for fabrication of the metallic denture base for the patient.

**Stepwise Procedure:**

- Primary impression was made in maxillary arch with impression compound and mandibular arch impression made with alginate (Figure 2).
- Custom tray was fabricated using autopolymerising resin .Custom tray borders where checked intra orally and sectional border molding was done using green stick compound and secondary impression made using zinc oxide eugenol impression paste. The posterior palatal seal was transferred to the secondary impression (Figure 3).
- Beading was done in plaster and pumice method and boxing done. Master cast was poured using dental stone and conventional casting procedure was carried out (Figure 4).
- Metal frame work was finished (Figure 4) and the fit was tried intra orally. Occlusal rims was fabricated over the metal frame work.
- Tentative jaw relation was recorded (Figure 5) and try in verification of the jaw relation was done.
- Processing of the denture was done followed by finishing and polishing of the denture (Figure 6).
- Denture insertion was done (Figure 7).
- Post insertion instructions were given to the patient regarding the denture maintenance and hygiene.



Figure 1

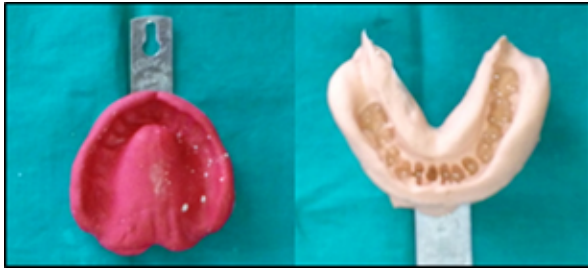


Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8

**CASE REPORT 2:**

A 50 years old male patient reported to the department of prosthodontics, CSICDSR, with a complaint of fractured old denture in the maxillary arch. Patient had a difficulty in chewing of the food and speech.

Intra oral examination revealed completely edentulous maxillary arch with high frenal attachment opposed by natural dentition in the mandibular arch. Generalised attrition was present in the mandibular arch natural teeth. Posterior Mandibular teeth were healthy and grade 1 mobility in relation to 42, missing 41 and the occlusal plane was unaltered ( Figure 9). Metal mesh reinforced single complete denture was planned for the treatment of the completely edentulous maxillary arch.

**Step wise Procedure:**

- Primary impression was made with impression compound in the maxillary arch and with irreversible hydrocolloid ( alginate ) in the mandibular arch (Figure 10).
- Custom tray was fabricated using autopolymerising resin. Custom tray borders where checked intra orally and sectional border molding was done using green stick compound and secondary impression made using zinc oxide eugenol impression paste. The posterior palatal seal was transferred to the secondary impression ( Figure 11 ).
- Beading was done in plaster and pumice method and boxing done. Master cast was poured using dental stone.
- Temporary denture base was fabricated using autopolymerising resin and occlusal rims were fabricated using modelling wax.
- Tentative jaw relation was recorded and mounted in mean value articulator (Figure 12) and Try in verification of jaw relation was done.
- Wax up was done and during the denture processing the flasking was done followed by the wax boil . The preformed

metal meshwork was adapted over the master cast. Trial closure was done and the adapted metal mesh was positioned using small increments of heat cure resin for the proper positioning of the metal mesh and final closure was done ( Figure 13).

- After curing the denture , deflasking was done followed by the finishing and polishing of the denture (Figure 14).
- Denture insertion was done (Figure 14). Post insertion instructions were given to the patient regarding the denture maintenance and hygiene.



Figure 9



Figure 10

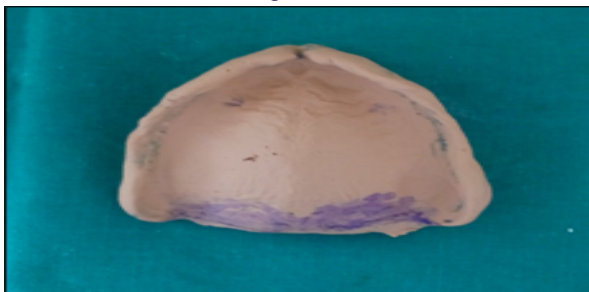


Figure 11

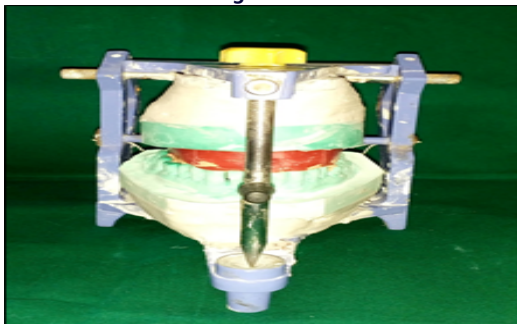


Figure 12

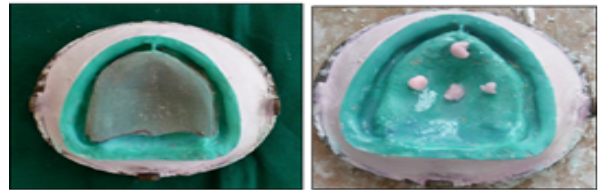


Figure 13



Figure 14



Figure 15

**DISCUSSION:**

A metal reinforced denture base is usually preferred among all the other methods of reinforcement as it reduces the chance of denture fracture caused by heavy biting and impact force problems and does not cause much difficulty in processing of the denture.

Metal framework reinforcement is used in complete denture prosthesis to improve the fracture resistance, dimensional stability, accuracy, weight and retention of a definite prosthesis<sup>2</sup>.

Variety of metals can be used to fabricate the metal frame work in the prosthesis such as cobalt –chromium, nickel chromium and titanium. They offer several advantages including high rigidity, fracture resistance, excellent strength to volume ratio, good adaptation to the supporting tissues, high thermal conductivity and no dimensional change in time. But also have certain disadvantages including high cost, difficult refitting of the denture and increased time consumption in comparison to the acrylic resins.

Several authors have described alternate economical techniques for suspending metal framework within denture bases before processing. Some authors advised the use of alginate edentulous impression tray as a method of reinforcing the denture base<sup>5</sup>. Metal reinforcement of all forms significantly increased the impact strength and tensile strength of the denture base.

**SUMMARY AND CONCLUSION:**

This article details a method for fabrication of metallic denture base in maxillary single complete denture and reinforcing single maxillary complete denture using a commercially available pre formed metal mesh. Conventional metal base dentures are costly and required more patient appointments hence another simple and economical method of reinforcing denture with commercially available metal mesh is also described in this article.

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