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METAL REINFORCED SINGLE COMPLETE DENTURE: A CASE REPORT

Author details:

1.Dr.Mitali Majumder, Assistant Professor, Dept.of. Prosthodontics, Burdwan Dental College & Hospital.

2.Dr.Sohini Banerjee, Assistant Professor, Dept.of.Periodontics, Dr.R.Ahmed Dental College & Hospital.

3.Dr.Debashis Mistry,GDMO,Amta ,Howrah

Abstract

Single complete denture reinforced with metal can be an amicable solution in various challenging clinical cases specially where midline fracture is a regular occurrence due to heavy occlusal load from opposing arch. A metal denture base due to its superior mechanical properties can be a promising alternative in such cases. This article describes a case report of successful oral rehabilitation of a patient with maxillary single metal based complete denture.

Key words

Metal denture base, single complete denture, metal reinforced complete denture, acrylic resin denture.

Introduction:

Single complete denture in maxillary arch reinforced with metal base presents a favourable design for rehabilitation of edentulous patients particularly in cases where is a risk of midline fracture caused by opposing natural dentition. These are commonly indicated for maxillary arch because of early tooth loss.[(1)]Excessive masticatory forces from opposing arch with natural dentition leads to denture instability, reduced retention, and fracture due to the bending forces and also leads to excessive ridge resorption making it a mobile ridge which further complicates the restorative procedure.[(2)]The most commonly used material to make complete denture is heat cure acrylic resin as they are esthetic and economic. However, there is more chances of fracture if the

thickness of denture base is less or minimal. To overcome this problem acrylic can be replaced with cast metal denture base, they are stronger, have greater resistance to fatigue and less likely to break under normal conditions. They are also effective in reducing fungal growth.

Case report

A 74 year old male patient reported to the department with the chief complaint of repeated fracture of maxillary denture. He had been wearing it since five years and the denture was repaired for several times with autopolymerizing resin. On examination, it revealed the patient had completely edentulous maxillary arch and partially edentulous mandibular arch with missing mandibular left central incisor(Fig.1& 2). Keeping the patients chief complain in mind fabrication of single maxillary metal based denture with removable acrylic partial denture was planned after proper oral prophylaxis.The steps(Fig.3a-d) are as follows:

Step 1

Preliminary impression for maxillary arch was made with impression compound (Pinnacle impression compound,DPI) and irreversible hydrocolloid(Alginate-DPI dust free) impression material for mandibular arch. Maxillary cast was made with type II gypsum product and for mandibular cast type III gypsum product were used.

Step 2

Custom tray was fabricated in the maxillary cast and border moulding was performed with low fusing type I impression compound (green stick)

Step 3

Final impression was made with low viscosity zinc oxide eugenol impression paste, master cast was poured with dental stone. (DPI)

Step 4

Master cast was duplicated with reversible hydrocolloid impression material [Agar, Supergel, Bosworth) and poured with refractory material.

Step 5

Wax pattern was made on refractory cast for metal framework with casting wax 0.5 mm extending to the crest of the ridge with retentive hole for metal and acrylic resin. Casting was done with cobalt chromium alloy (Bego, Germany) after investing it with phosphate bonded investment material.(Bego,Wirowest)

Step 6

Permanent denture base was waxed up followed by flasking, dewaxing, and packing done with heat cure acrylic resin.

Step7

Occlusal rim made with wax and jaw relation procedure was carried out in a conventional manner.

Step 8

Teeth arrangement was done in class I molar relationship and try in was done[Fig.4].

Step 9

Finally acrylization of denture was done with heat cure arylic resin and finished and polished for final insertion.

Step 10

Complete denture for maxilla with metal base inserted in upper arch and for removable acrylic partial denture was inserted in the mandibular arch[Fig.5 &6].

Step11

Patient was instructed properly for post insertion maintenance and oral hygiene. Follow up was done at 1st week,1st month,3rd month and pressure spots were checked and corrected. Patient was satisfied with the final outcome.

Discussion

Conventional complete denture made with heat cure acrylic resin may not proved to be satisfactory in all clinical situations .(3) Heat cure acrylic resin denture base have good mechanical, biological, and esthetic properties and due to that it is regular material of choice in fabrication of complete denture. However, their impact and fatigue strength is not satisfactory in clinical situations that include heavy occlusal load or masticatory forces from natural teeth in opposing arch or in cases with bruxism and clenching.(4)Metal substructure with meshwork design over the ridge used in this case provide good retention and stability to the denture with high fracture resistance. Metal denture base is used while giving single complete denture with increased masticatory force and midline fracture is a regular occurrence. Metal denture base has number of advantages i.e more retention, improved thermal conductivity, good sensory interpretation, strong even in thin section, improved phonation, easier to maintain.(5)However, the major disadvantages associated with the denture included increased cost, difficult fabrication, difficulties in relining and rebasing.(6)Nevertheless they may be indicated where heat cure resin fail to provide acceptable physical properties.

Conclusion

The problem involved in providing comfort, function, and esthetics is a vigorous challenge for prosthodontist. Critical evolution and planning requires for fabrication of single complete denture with acceptable result. The complaint of repeated fracture of denture is addressed satisfactorily through this denture base reinforced with metal and satisfactory clinical outcome was achieved.

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Fig.1 Maxillary Arch Without Denture

Fig.2 Frontal View of Both The Jaws

Fig.3(a-d)Laboratory steps of metal denture fabrication

Fig.4 Frontal view with trial denture

Fig.5.Final denture try-in

Fig.6.Final denture insertion in oral cavity