

Maxillary Single Complete Denture with Metal Mesh Reinforcement: A Case Report

Bhandari A,¹ Thakur SN,² Khanal B,³ Mishra S⁴

¹Post Graduate Resident, Department of Prosthodontics and Maxillofacial Prosthetics, Chitwan Medical College, Chitwan, Nepal

^{2,3,4}Associate Professor, Department of Prosthodontics and Maxillofacial Prosthetics, Chitwan Medical College, Chitwan, Nepal

ABSTRACT

Single complete denture opposing natural dentition is common occurrence in daily practice. Opposing natural dentition could be completely or partially edentulous. Fabrication of single complete denture is always challenging to the dentists. It is difficult to achieve balanced occlusion in such cases because the remaining natural dentition could be extruded from socket, tilted or mispositioned. Heat cured denture base resins are most commonly used material for fabrication of denture but they tend to fracture when it is opposed by the natural dentition. The use of a metal mesh in denture base for reinforcement offers many advantages in such cases. This case report presents a case of fabrication of maxillary single complete denture with metal mesh opposing natural dentition in lower arch.

Key words: Single complete denture, Metal mesh, Fracture, Reinforcement

INTRODUCTION

Natural teeth, fixed restorations, a removable partial denture, or an existing complete denture are all possible oppositions to single complete dentures.¹ The most common clinical situation involving a single complete denture is that of an upper complete denture and lower natural teeth.² Heat cured denture base resins are the dominant material used for the fabrication of denture bases as they possess acceptable physical, biological and aesthetic characteristics at moderate cost. However, denture base resins fail in some instances for

example, fracture of single complete denture under excess masticatory forces.³ Koper asserts that any or all of the following can cause occlusal problems and denture base fractures in a single complete denture: (1) The position of the mandibular teeth, which may not be properly aligned for the bilateral balance required for stability, (2) The flexure of the denture base, and (3) Occlusal stress on the maxillary denture and the underlying edentulous tissue from teeth and musculature accustomed to opposing natural teeth.⁴ In fracture prone areas, reinforcement can be done by adding solid metal forms and various types of fibres. Metals in the form of wires, plates, nets or fillers can be used.⁵ Metal mesh provide greater strength, greater resistance to fatigue and greater resistance to breakage. Hence it could be a good treatment option in cases of single complete dentures opposing natural dentition. A few disadvantages include poor adhesion to denture base, unesthetic appearance and prone to corrosion.⁶

Conflict of Interest: None

***Corresponding Author**

Dr. Anamika Bhandari,
Post Graduate Resident, Department of
Prosthodontics and Maxillofacial Prosthetics,
Chitwan Medical College, Chitwan, Nepal
Phone No: +9779861798821
E-mail: anamikabhandari051@gmail.com

CLINICAL REPORT

A 70 years old male patient visited Department of Prosthodontics and Maxillofacial Prosthetics, School of Dental Sciences, Chitwan Medical College, Nepal, with chief complaint of loss of all his teeth in upper arch and wanted them to be replaced by a prosthesis to restore esthetics and speech. Past dental history revealed that patient lost his teeth in upper arch 2 years back due to caries and periodontal disease. A thorough intraoral examination was done. The maxillary arch was completely edentulous supported by a well-formed ridge. Mandibular teeth were periodontally stable without any mobility. (Figure 1,2)

A treatment plan was formulated and patient was given the options of conventional single maxillary complete denture and implant supported upper fixed denture. The surgical and economy criteria of the second option lead the patient to opt for the first treatment option of a single complete denture for maxillary edentulous arch with metal mesh reinforcement in acrylic denture base.

PROCEDURE

Primary impressions of the maxillary and mandibular arches were made with alginate impression material (Zermack, Germany). The primary impressions were disinfected and poured in with dental plaster (Kaldent, India) (Figure 3) and dental stone (Kalstone, India) respectively for maxillary and mandibular impression. A custom tray was fabricated on the maxillary primary cast after adaptation of a wax spacer. (Figure 4)

On the second visit, border molding was done using the custom tray with green stick (DPI, India) and a wash impression was made using

light body impression material (Extreme lite, Zermack, Germany). The impression was disinfected and master cast was poured using dental stone. (Figure 5 and 6)

A temporary record base for the maxillary arch was made using autopolymerizing acrylic resin (RR, Dentsply) and occlusal rim was made using modeling wax. Maxillo-mandibular jaw relation records were established and master cast was mounted on mean value articulator using the jaw relation records. (Figure 7 and 8)

The maxillary teeth were arranged according to the contour of the maxillary occlusion rim and aligned along the occlusal surfaces of lower natural teeth. A try in was done in the next appointment. (Figure 9)

The maxillary temporary denture base with the teeth arrangement was then invested and dewaxed using the regular procedure. Prior to packing, a metal mesh was incorporated in the maxillary mold and denture was packed using heat cured denture base material (Trevalon, Dentsply) and cured in the regular way. (Figure 10)

After bench cooling, the denture was removed, finished and polished. (Figure 11) Insertion was done and post insertion instructions were given to the patient (Figure 12). Patient was later recalled for follow up adjustment.

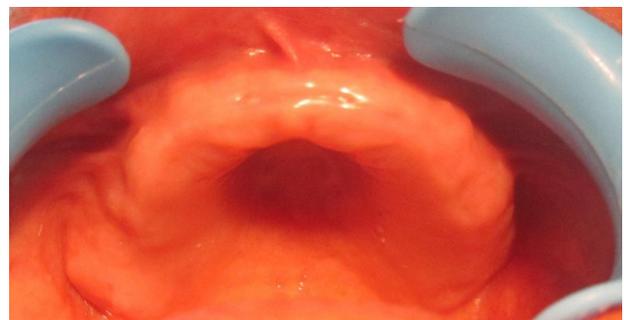


Figure 1: Maxillary Arch



Figure 2: Mandibular Arch



Figure 5: Final Impression



Figure 3: Maxillary Primary Cast



Figure 6: Maxillary Master Cast



Figure 4: Maxillary Special tray



Figure 7: Recording Maxillomandibular relation

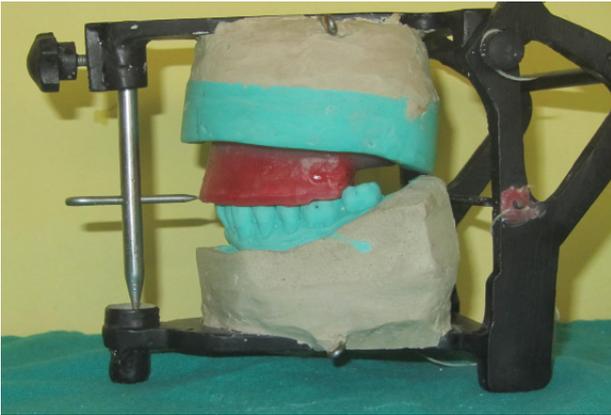


Figure 8: Mounting of casts in articulator



Figure 10: Maxillary Metal Mesh prior to packing the denture



Figure 9: Try In



Figure 12: Denture Insertion



Figure 11: Processed Denture



Figure 13: Improved esthetics after denture insertion

DISCUSSION

The problems involved in providing comfort, function, proper esthetics, and retention for the maxillary complete denture patient with natural opposing dentition can be challenging. According to Koper, careful preparation of the patient is important. It provides the new complete denture patient an opportunity to adapt to complete denture and allows the dentist to evaluate his patient physically and emotionally before fabrication of the final complete denture.⁴

The lower teeth determine the occlusal plane of a single maxillary full denture, which typically has a number of unfavorable tooth inclinations as a result of the elongation of teeth that have not experienced opposing contacts since a long time. These adverse tendencies can result in forces in unfavorable directions on upper complete denture. Shunting type stresses frequently cause the basal seat tissues to become inflamed or the bone supporting the denture to resorb. The establishment of an occlusal arrangement without modifying the lower teeth is the most frequent mistake made when fabricating a complete denture against lower natural teeth.²

The problems that come around while fabricating maxillary complete denture opposing natural mandibular dentition is difficulty in achieving esthetics and phonetics while arranging the maxillary teeth. Also abrasion of artificial teeth if acrylic resin is used or abrasion of natural teeth if porcelain teeth is used are the additional issues to deal with.⁷

Driscoll has stated that, when the dentist is fabricating a single complete denture, control of any of the elements of Hanau's Quint is limited and it may adversely affect the attainment of bilateral balance. Also he has stated that for single complete denture, anatomic teeth is better to use for the esthetic reason and to make the adjustments easier.⁸

Use of acrylic teeth is favored in single complete denture than porcelain teeth as minor adjustments required might weaken the porcelain teeth and also the wear resistance of acrylic teeth is more closer to the natural teeth than the porcelain teeth.⁹

Mattie stated in his article that while we are using metal alloys to increase the strength of denture bases, the resin metal junction should be carefully positioned to maximize strength, minimize weight and ensure proper palatal contours. Failure to develop proper palatal contours will affect the phonation.³

When relining is necessary in denture with the metal palate, retention for the reline material may be obtained by mechanically roughening the metal or acid etching it. The reline is then processed in the usual manner.¹⁰ Bruce has defined a method for reshaping natural teeth by using transparent resin template to achieve an acceptable occlusion while fabricating complete dentures opposing natural dentition.¹¹

CONCLUSION

Metal mesh reinforcement for conventional complete dentures can provide many advantages over commonly used acrylic dentures. They are more retentive, stronger and comfortable to the patient. They even reduce the number of post insertion visits of the patient and patient satisfaction is better with its use. But it should be used cautiously as metal allergy to some patients might cause a big concern.

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