

Management of Occlusal Discrepancies in Patient with Single Complete Denture

Avinash B. Sagvekar*, Aruna J Bhandari**, Deepak Vikhe***, Akshay Joshi****

Abstract

Dentate arch opposing an edentulous arch, are usually adversely affected due to the forces generated. In addition prosthesis having occlusion that is not balanced in centric and/or excursive movements will create instability and loss of retention and this may affect the success and psychology of the patient. Occlusal problems and denture base fractures are seen in patients with single complete denture due to: Occlusal stress, interference and position of the teeth, which are not properly aligned for the bilateral balance needed for stability and flexure of the denture base (1). This case report highlight regarding the management of occlusal discrepancies and removal of interferences in Single Maxillary Complete Denture by Bruce method (3).

Key words : *Balanced occlusion, single complete denture, denture fracture, occlusal discrepancies and occlusal interferences.*

Introduction

Single complete denture construction against natural dentition is a very challenging task for a dentist due to certain drawbacks like frequent denture fracture, dislodgement, difficulty to obtain occlusal balance, and achieving satisfactory esthetics (due to fixed position of the natural teeth) (2). According to MM. DeVan's principle the aim and objective is perceptual preservation of what remains of human masticatory apparatus rather than meticulous restoration of the missing structure. This goal is impossible to achieve without understanding the occlusal biomechanics that allows us to obtain a physiological occlusion: acceptable interocclusal distance, stable jaw relationship with bilateral tooth contacts in centric relation, stable tooth quadrant relationships with axially directed forces, multidirectional freedom of tooth contact throughout a small range (within 2 mm) of mandibular movements(2). Unfortunately, when only one arch is edentulous, tooth position in the dentate arch may preclude such objectives being reached and the unfavourable force distribution may cause adverse tissue changes that are going to compromise optimum function. It is therefore critical to identify these problems like arch relationship or occlusal plane discrepancies, jaw relationship extremes, excessively displaceable denture-bearing tissue and to correct them soon as possible. This case report will

highlight about occlusal corrections prior to a single complete denture fabrication.

Case Report

A male patient of age 57 years was reported to Department of Prosthodontics, Rural Dental College Loni, with the chief complaint of difficulty in chewing and repeated broken denture. Dental history revealed that patient was using maxillary single complete denture 2 months which eventually fractured in the mid-line.

Intraoral examination

Complete edentulous maxillary arch and partially edentulous mandibular arch with missing 46 and 47. (Figure 1. A, B, C).



1(A)

1(B)



1(C)

Pre-operative Intraoral photographs of maxillary and mandibular

*Post graduate student, **Professor and HOD

**Reader, Department of Prosthodontics, Rural Dental College, Loni.

****Senior lecturer, KBH'S MGV Dental College Nashik

Correspondence Author:

Dr. Aruna J Bhandari
Professor and HOD, Department of Prosthodontics
Rural Dental College, Loni.

Treatment Plan Suggested:

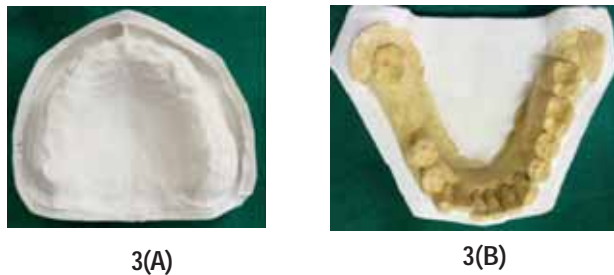
- Fabrication of maxillary single complete denture by conventional method
- Removal of interferences and correction of occlusion by Bruce method
- Replacement of 46 and 47 by removable partial denture and

Prosthesis fabrication:

After thorough evaluation patients consent was taken. Preliminary Impression of the maxillary arch was recorded in Type I medium fusing impression compound and impression of mandibular dentulous arch was made in irreversible hydrocolloid alginate impression material (Figure 2A and 2B). Maxillary Impressions was poured in Type II gypsum product and mandibular impression was poured in Type III gypsum product and diagnostic casts were obtained (Figure 3A and 3B).

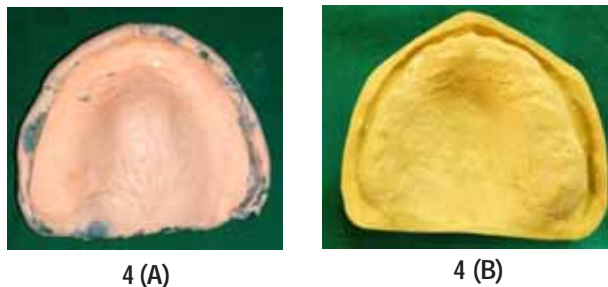


Maxillary Preliminary impression and Mandibular Alginate impression.



Maxillary and Mandibular Diagnostic cast

Maxillary custom tray was fabricated by conventional method using forma tray material. Custom Tray was adjusted, border moulding procedure was done using sectional border moulding by low fusing impression material and final wash impression was made in zinc oxide eugenol impression paste (Figure 4A). Impression was poured in Type III dental stone and master cast was obtained (Figure 4B).



Maxillary final impression and master cast

Record base was fabricated by sprinkle on method with self-cure acrylic resin material (DPI). Maxillary occlusal wax rim was made and adjusted. Tentative jaw relation was recorded and face bow transfer was done (Figure 5A and 5B). Maxillary occlusal rim with jaw relation record was articulated with the mandibular dentulous cast and then mounted on Hanau wide view articulator. Maxillary teeth selection and shade matching was done by taking help of the remaining lower natural teeth. Teeth arrangement was done and maximum intercuspation was achieved (Figure 6A, 6B, 6C).



5 (A) 5 (B)

Face bow transfer and orientation jaw relation recorded



6 (A) 6 (B)



6 (C)

Mounting and maxillary teeth arrangement

Lateral and protrusive movements were done on articulator and interferences were marked on the mandibular cast. Vacuum formed clear template was made over the lower cast with 0.02 inch thick Biostar sheet. After preparing the template interferences were removed in marked areas on the mandibular cast. Voids were seen on the prepared areas, Later the template was transferred in patient's mouth and interferences were removed according to the voids seen over the template intraorally by Bruce method (4,5) (Figure 7A , 7 B and 7C).



7 (A)



7 (B)



7 (C)

Interferences marked, clear acrylic template prepared and transferred intraorally

New impression of lower arch was made in Alginate and final working cast was obtained and remounting was done. Teeth arrangement was done with maximum intercuspation using modified lower dentate cast. Try-In was done followed by wax up and carving (Figure 8). Maxillary single complete denture and mandibular partial denture was fabricated in heat cure acrylic resin. Denture insertion was done and evaluated intraorally by clinical remount for occlusal corrections (Figure 9). Post insertion instructions and regular follow up was done.



8



9

Discussion:

Single maxillary edentulous arch opposing lower natural teeth is one of the most common clinical situations seen. When single complete denture is opposed by natural teeth, it will almost require some degree of contouring to provide a harmonious occlusion. The reason for such alteration is mainly due to:

unfavourable inclination of the occlusal plane and malpositioned individual teeth resulting with steep inclinations and wide buccolingual width of natural teeth. Due to the presence of long standing uncontrolled occlusal forces, accelerating loss of bone and also excessive displaceable tissue, which can be a problem for denture fabrication.

The forces of occlusion are resisted by the mucoperiosteum which allows some movement of the denture base by its resiliency. If the tissue changes allow excessive displacement, the movement of the denture under load will be greater with resultant dislodgement (2). The opposing arch's condition of an irregular occlusal plane also predisposes the denture to dislodgement. After the loss of the maxillary teeth and in the absence of the prosthetic treatment, the opposing dentition tends to tilt and extrude compared to a normal relationship which results in an unfavourable force distribution. The teeth that are most prominent in the vertical plane should be subjected to selective grinding in order to ensure that a sufficient number of teeth will be in contact with the artificial ones in the same time². Because of the pressures exerted by the mandibular remaining teeth, the alveolar maxillary ridge is extremely resilient and mobile (flabby ridge) due to the replacement of the bone by fibrous tissue. This is a consequence of excessive load of the edentulous ridge and unstable occlusal conditions which will provide poor support, but some retention due to its resilient state for the complete denture.

Conclusion

The decision to make a single complete denture cannot be considered lightly. Careful observation and recording of all diagnostic information must be considered before a decision is made to construct a single complete denture. Certain conditions must be evaluated and corrected early in the treatment to provide more stability to the prosthesis. Therefore proper evaluation of occlusion is mandatory for rehabilitation of single complete denture.

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