

Fabrication of Overdenture against a Nonmodified Natural Dentition and Removable Partial Denture using Meyer's Technique: A Preventive Approach

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ABSTRACT

A clinical report of a patient having partially edentulous maxillary arch and dentulous mandibular arch has been presented. Patient came to the Department of Prosthodontics with the chief complaints of loosening of the prosthesis. The patient was rehabilitated with a maxillary complete overdenture and mandibular removable partial denture using the functionally generated path technique to achieve harmonious occlusion between the complete denture and the natural dentition.

Keywords: Single complete overdenture, Functionally generated path, Compound, Stone core.

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INTRODUCTION

Single complete denture construction against a nonmodified natural dentition is still a very challenging task to a dentist, though a variety of techniques have been suggested through the years. Stansbury described the first functional chew in technique (1928) for an upper complete denture opposing lower natural teeth, based upon the work of Meyer.¹ Meyer claimed to obtain occlusion in construction of complete dentures without the need of an adjustable articulator.²⁻⁴ The materials and the equipments used were of a very simple nature but the procedure consumed a considerable amount of time.

The technique, however, when modified to a degree and applied to the construction of a single denture either maxillary or mandibular appears to have a great advantage. It is particularly applicable when a single denture is to be made to the existing conditions of the opposing natural teeth. This article will present a case of single maxillary complete overdenture construction against a nonmodified mandibular natural dentition and a removable partial denture.

Case Description

Thorough examination of the oral cavity was done (Figs 1 and 2). Prior to denture construction, thorough oral prophylaxis was done. In the maxillary arch, two remaining



Fig. 1: Maxillary arch



Fig. 2: Mandibular arch

canines, i.e. 13 and 23 were preserved as overdenture abutments after completing their root canal treatment. The lower natural dentition had a few missing teeth, i.e. 46, 41, 31, 32, 33, 34, 35, 36 which were replaced with a removable partial denture.

Procedure

After all prerequisite procedures were completed impressions of both the jaws were made. Irreversible hydrocolloid impression material (Zelgan 2002; Dentsply India, Gurgaon, India) was used for making the impression of the opposing natural dentition.

The preliminary impression of the maxillary arch was made with impression compound (DPI Pinnacle, Dental Products of India, Mumbai) and preliminary cast was made. A custom tray was fabricated over the preliminary cast, border molding was performed, and a final impression was made with zinc oxide eugenol impression paste (DPI Impression paste, Mumbai). The final or corrected impression was poured with mechanically spatulated type III dental stone (Kalabhai, Mumbai). When set, the casts were removed from the impressions, and the posterior palatal seal was established on the maxillary cast. After this, the casts were trimmed and indexed. Then two autopolymerizing acrylic resin (Trevalon, Dentsply Ltd, Gurgaon, India) temporary record bases were constructed on the maxillary cast. A modeling wax occlusion rim (Metrodent, Mumbai) was made on one temporary record base and an impression compound occlusion rim was made on the other temporary record base.

The wax occlusal rim was corrected to give the desired lip support and adjusted to establish the desired vertical dimension of occlusion. Phonetics tests, determination of the existence of the adequate interocclusal distance, and esthetics were used as guides in determining the vertical dimension of occlusion. The centric relation position was recorded at the selected vertical dimension of occlusion. A tentative jaw relation record was made and the casts were mounted on an articulator. Denture teeth (Acrylux ruthinium, Ruthinium Dental Products Private Limited, New Delhi) were selected and positioned in their respective positions. After the setup was completed, try in was done in the patient's mouth.

The duplicate baseplate with a modeling plastic occlusal rim was placed on the cast. The modeling plastic occlusal rim should be approximately twice the buccolingual width of the molar teeth so that it should extend beyond and receive an impression of the central fossae of all the lower teeth.

The modeling plastic was warmed and adapted to the baseplate, and the articulator was closed so indentations were formed in the warm modeling plastic by the opposing cast. When cool, the occlusal rim was trimmed until there was 2 mm space between it and the mandibular anterior teeth. The posterior portions of the occlusal rim were trimmed until the buccal and the lingual cusps of mandibular teeth do not touch the occlusal rim. The vertical dimension of occlusion was maintained by extension of modeling plastic ridge into the central sulci of the opposing mandibular teeth.

Now, the baseplate with compound occlusal rim was taken to the patient's mouth, and the patient was instructed to slowly make the chewing motions (Fig. 3). This can be



Fig. 3: Compound index of mandibular arch

done by asking the patient to open the mouth, slight movement of the jaw to either right or left, and then slide the jaw back into the central position. This action tends to adjust the compound which fits into the central fossae of the lower teeth and rounds off those eminences of the compound which fit into the accessory grooves of the lower teeth.

Carding wax of about one-eighth inch was now added to the full width and length of the occlusal surface of the compound occlusal rim. Articulator was now closed, making an indentation of the lower teeth into the wax. The temporary denture base with the compound rim and the carding wax was now placed in the patient's mouth. The patient was instructed to open the mouth and move the jaw to either right or left until contact was made. After contact was made, the patient was instructed to close the jaw into centric position. The compound in the central fossae acts as a guide to preserve the cuspal height. This movement was made in both right and left lateral excursions. After this, record was made for the protrusive movement.

STONE CORE

A small mix of type III dental stone was made and vibrated into the wax paths of cusps to a depth of approximately 10 mm. After the stone was set, the wax was cleaned from the stone core, and the temporary record base and the impression compound was removed from the cast (Fig. 4). The stone cusp path record was now attached to the articulator against the waxed denture and its occlusal contact with the stone core was carefully examined. The maxillary denture teeth were set or grounded to fit the generated path as recorded in the stone core. The setup was tried in the patient's mouth and esthetics, centric relation and eccentric movements were checked.⁵



Fig. 4: Stone core



Fig. 5: Postoperative view

After the trial, setup was checked and when found satisfactory, it was removed from the mouth and denture processing was done. Since, all the centric and eccentric interferences were already corrected in the trial denture, the processed denture was now ready to be inserted in the patient's mouth without occlusal balancing in the processed denture (Fig. 5).

DISCUSSION AND CONCLUSION

To achieve a harmonious occlusion between the maxillary complete overdenture and the mandibular natural dentition, the functionally generated path technique proposed by Meyer has been utilized. In this technique the paths of opposing cusps in their gliding motions by means of wax rims is recorded and, then the teeth are set against a stone negative of this chewin to achieve harmonious occlusion without compromising the health of natural dentition.

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