

Functionally Generated Amalgam Stops for Single Complete Denture: A Case Report

Niyati Singh

Senior lecturer, Department of Prosthodontics, Rama Dental College and Hospital, Kanpur, Uttar Pradesh, India.

Correspondence to:

Dr. Niyati Singh,
Flat No.203, Concord Apartments,7/190,Swaroop Nagar,
Kanpur, U.P, India.

Contact Us : editor@ijdmr.com
Submit Manuscript : submissions@ijdmr.com
www.ijdmr.com

ABSTRACT

Single complete denture opposing natural dentition is a common occurrence in clinical practice. Many difficulties confront the dentist rehabilitating patients with this clinical pattern. One of the most common problem with dentures opposing natural teeth is that of abrasion of the artificial teeth if acrylic resin is used or the abrasion of natural teeth if porcelain is used. This article reports a case of a single complete denture with a technique of occlusal refinement by functionally generated amalgam stops condensed in prepared resin teeth after initial balancing of the denture with semi-adjustable articulator.

KEYWORDS: Amalgam, Balanced Dental Occlusion, Complete Denture

INTRODUCTION

Single complete denture (SCD) opposing natural dentition is a common occurrence in clinical practice. Several techniques have been described in the literature whereby the necessary tooth modifications are determined prior to denture construction. The first method was originally described by Swenson. The maxillary and mandibular casts are mounted on the articulator, using a provisional centric relation record at an acceptable vertical dimension. A maxillary base is made, and denture teeth are set. If the lower natural teeth interfere with the placement of the denture teeth, they are adjusted. Once the occlusal modification appears to be sufficient, the denture teeth are reset and prepared for the try-in.

A common pattern of tooth loss involves the completely edentulous maxillary area opposing a mandibular complement of natural teeth with missing first molars, or second premolars, or both. In these situations the remaining molars are often severely inclined mesially and their distal halves

supraerupted.

If the molars are not severely tilted, they may be reshaped by selective grinding.

Many techniques have been described explaining ways to achieve a balanced occlusion for a complete maxillary denture opposing natural teeth. They basically fall into two categories: those that dynamically equilibrate the occlusion by the use of a functionally generated path and those that statistically equilibrate the occlusion using an articulator programmed to simulate the patient's jaw movement.

Another problem with SCD is attrition of denture teeth if resin teeth are used and attrition of natural teeth if porcelain is used.

The materials available for occlusal posterior tooth forms are acrylic resin, gold, porcelain, acrylic resin with amalgam stops, and IPN resin. Amalgam stops wear less and cause less wear of opposing natural

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teeth. Amalgam is less expensive than porcelain, IPN or gold occlusals. This article describes a technique of occlusal refinement by functionally generated amalgam stops.¹

CASE REPORT

A 65 year-old male patient was presented in the department of prosthodontics with a completely edentulous maxillary arch and completely dentulous mandibular arch (Fig 1). A SCD was fabricated in the usual manner. A balanced occlusion was achieved with acrylic resin teeth.²



Fig 1-Pre Operative View

Occlusal preparations, 1.5-2 mm deep were made in posterior denture teeth, using inverted cone diamond bur extending to include as much of the articulating paper tracing as possible and sparing thin borders of the tracing areas to maintain vertical dimension

A mix of amalgam was triturated according to the manufacturer's directions. Amalgam was then condensed into the occlusal preparations with the help of amalgam condenser. Preparation should be over packed 1 mm or more using heavy pressure to ensure margins completely covered with well-condensed amalgam (Fig 2).



Fig 2-Amalgam Condensed Into The Occlusal Preparations

Denture was placed into patient's mouth and the patient was directed to close with tapping action on the teeth in centric relation and to perform all eccentric movements in order to carve the condensed amalgam (Fig 3).



Fig 3-Post Operative View

In this situation, the vertical relation at occlusion was maintained by unprepared borders of tracing areas. Excess amalgam was removed and patient was instructed to continue all functional movements of the jaw until initial setting of the amalgam occurred. Excess amalgam was removed again and occlusal pattern was examined for deficient margins. The denture was delivered and post-insertion instructions were given. Amalgam stops were polished after 24 hours.

DISCUSSION

The main drawback of acrylic teeth used in SCD opposing natural dentition is rapid wear on occlusal surface which affects the vertical dimension of occlusion and tooth relationships resulting in increased horizontal stresses and their associated sequelae.³ The rate of wear also depends on the patient's functional and para-functional habits.

Inserting amalgam stops into the resin occlusal surfaces slows down and controls this wear.

This article describes a case report of a SCD patient with a technique of occlusal refinement by functionally generated amalgam stops condensed in prepared resin teeth after initial balancing of the denture.⁴The amalgam stops can be carved either on the programmed articulator or directly in the patient's mouth. The amalgam stops generated on the programmed articulator are carved according to the articulator movements guided by condylar and

incisal guidance.^{5,6} The programmed articulator cannot perfectly copy patient's mandibular movements as there may be a positive or negative error in the articulator adjustment. Due to straight condylar path, fixed intercondylar distance, mechanical incisal guide table, the balanced occlusion (achieved with articulator-generated amalgam stops) ultimately needed to be refined in patient's mouth by selective grinding procedure in the end. The functionally generated path technique described in this article carves the amalgam in plastic stage directly in the patient's mouth. Thus, intercuspal contacts in all excursions need not to be refined by selective grinding procedure (which is required in articulator generated path technique). This technique is less time consuming and more accurate than articulator generated amalgam stop technique. But, if the denture bases do not have intraoral stability or if the patient is physically unable to form a chew-in record, the articulator-generated path technique will be preferred. The occlusion developed with a functionally generated amalgam stop technique provides a simple method to establish a balanced occlusion with extended wear capabilities. The functionally generated path in amalgam insert is in harmony with the patient's mandibular movements.

Dentures fabricated using this technique require fewer and simpler post-insertion adjustments. The only disadvantage using amalgam stops (either articulator or functionally generated) is their esthetic unacceptance.

CONCLUSION

The patient who requires a single denture opposing a natural or restored dentition challenges the clinician even more than the completely edentulous patient does. This is due to the biomechanical differences in the supporting tissues for the opposing arches. Certain conditions must be evaluated and corrected early in treatment to provide for a more stable prosthesis. The unique biomechanical features of the patient with a single denture have been emphasized, and methods for controlling denture tooth and opposing tooth position to maximize stable functional relationships have been presented.

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