

Twin Occlusion Prosthesis: Management of Hemimandibulectomy Patient: A Case Report

Pankaj Datta¹, Dhaniram Talukder², Sonia S. Datta³

Abstract

Post hemimandibulectomy prosthetic rehabilitation poses a challenge because of facial asymmetry, altered muscle function, deviation of the remaining mandible to the resected side, producing compromised esthetics and function. The treatment options in such scenario are surgical restoration, physiotherapy or prosthodontic intervention. The prosthetic management is challenging in order to develop occlusal scheme with compromised retention and stability. Prosthodontic treatment along with physiotherapy may be useful in reducing mandibular deviation and improving masticatory efficiency. A patient of hemimandibulectomy due to surgical resection of squamous cell carcinoma was treated with twin occlusion prosthesis with the objective of improving mastication and phonetics.

Keywords: hemimandibulectomy; Twin Occlusion Prosthesis; Prosthetic Management; Squamous Cell Carcinoma.

Introduction

One of the most challenging and demanding maxillofacial endeavors is the construction of functional dentures for a patient who has undergone a mandibular resection. Segmental resection of the mandible results in physiological and esthetic problems, the most significant difficulty encountered is mandibular deviation towards the defective side. Apart from deviation, other dysfunctions such as difficulty in swallowing, speech, mandibular movements, mastication, respiration and psychic functioning are seen. Appropriate treatment option is to be chosen depending upon the degree of loss of structure and function. Hiong's treatment plan for hemimandibulectomy patients stated that if the patient reports to a maxillofacial prosthodontist after surgery and the scar tissue has already been formed, the prosthodontist can guide

the patient's mandible into a functional position with a prosthesis [1]. The success of prosthetic treatment depends upon the amount of remaining tissues because the loss of tissues in greater amount result in greater deviation of the mandible to the resected side [2]. Various prosthetic treatments are available and depending upon the clinical situation appropriate option should be selected. This treatment plan includes use of a palatal ramp, guiding flange and two rows of maxillary posterior teeth on unresected side (twin occlusal prosthesis) [3]. This article presents a technique of restoring oral function for a hemimandibulectomy patient by twin occlusion prosthesis.

Case Presentation

A 31 year old male patient was reported to Inderprastha Dental College and Hospital, Ghaziabad, Uttar Pradesh, with a chief complaint of difficulty in chewing. The medical history revealed that he was diagnosed for squamous cell carcinoma on the right side of the mandible, for which he had undergone extensive resection of the mandible on right side upto the canine region, 1 year back. The patient gave a history of tobacco chewing, for 6-7 years. Extra oral examination showed asymmetrical face, and a convex profile. There was deviation of the mandible to the right side (Figure 1). On palpation the mandibular ridge was absent till canine region on the right side (Figure 2). On intra-oral examination, it was found that

Author's Affiliation: ¹Dean, Professor & Head ²PG Students, Department of Prosthodontics and crown & bridge, ³Associate Professor, Department of Public Health Dentistry, Inderprastha Dental College and Hospital, Sahibabad, Ghaziabad, Uttar Pradesh 201010 India,

Corresponding Author: Pankaj Datta, Dean, Professor & Head, Department of Prosthodontics and crown & bridge, Inderprastha Dental College and Hospital, Sahibabad, Ghaziabad, Uttar Pradesh 201010 India,

E-mail: pankajdatta97@gmail.com

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Table 1: Cantor & Curtis Hemimandibulectomy Classification

CLASS I	Mandibular resection involving alveolar defect with preservation of mandibular continuity
CLASS II	Resection defects involve loss of mandibular continuity distal to the canine area.
CLASS III	Resection defect involves loss up to the mandibular midline region.
CLASS IV	Resection defect involves the lateral aspect of the mandible, but are augmented to maintain pseudo articulation of bone and soft tissues in the region of the ascending ramus
CLASS V	Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations.
CLASS VI	Similar to class V, except that the mandibular continuity is not restored.

**Fig. 1:** preoperative extraoral frontal view**Fig. 4:** primary impression of mandibular arch**Fig. 2:** preoperative extraoral lateral view**Fig. 5:** fabrication of occlusal block with adams clasp**Fig. 3:** primary impression of maxillary arch**Fig. 6:** final twin occlusal prosthesis



Fig. 7: post operative intraoral view



Fig. 8: post operative lateral occlusion view

maxillary arch had all teeth present and mandible was resected on right side up to the canine region. The condition was a Class III Cantor and Curtis hemimandibulectomy classification (table 1) [1]. The patient had a tendency to deviate on right side. Even on manually guiding the mandible it was not possible to achieve the occlusal contact of maxillary and mandibular teeth on unresected side. So, it was decided to provide an extra row of teeth in maxillary prosthesis to provide occlusal contacts on unresected side. Hence, maxillary twin occlusion prosthesis was fabricated.

Treatment

Impressions were made with irreversible hydrocolloid (Figure 3, 4) and poured in type III dental stone. Maxillary base plate was fabricated for recording functional maxillomandibular relationship. (Figure 5). 2 Adams clasp were fabricated i.r.t 14, 26, which act as a retentive arm. (Figure 6). The patient was instructed to move his mandible as far as possible onto the untreated side and then gently close his mandibular jaw into that

position to record a functional maxillomandibular relationship. Then, an extra row of nonanatomic teeth was arranged at the recorded position on unaffected side. A trial wax set-up was tried in the mouth and was evaluated for phonetics and occlusion. The prosthesis was fabricated, finished and polished. The prosthesis insertion was done and patient was trained to close mandible in such a way that appropriate occlusal contact can be obtained between the second row of teeth in maxillary prosthesis and mandibular natural teeth on right side (Figure 7, 8). Oral hygiene instructions were given to the patient to ensure longevity of remaining natural teeth and the prosthesis. Since 1 year the patient was suffering from difficulty in chewing. With the prosthesis he was able to chew the food and had an improvement in type of food which he had. He could now have solid diet as compared to only liquid and semisolid diet which he had without the prosthesis. The facial esthetics was also improved to some extent due to limitation of deviation by the prosthesis.

Discussion

Mandible is a single bone that creates peripheral boundaries for the floor of the oral cavity. Muscles of mastication are bilaterally attached to the mandible to generate a variety of complex mandibular movements useful in speech, swallowing, mastication and respiration. Mandible and muscle of mastication also give form to the lower third of the face. Disruption of the mandible has the potential to disrupt any of this function. Form and functions are the primary concern while rehabilitating mandibulectomy patient [3].

Successful rehabilitation of edentulous mandibulectomy patients is more difficult than that of a dentulous patient. It was described that the difficulties encountered as: limited coverage and retention, grossly impaired relation of the mandible to the maxilla, limited movement of the mandible and loss of facial structures as well as sensory and motor [4]. It was recommended that immediate reconstruction of resected part of mandible should be done to recover both facial symmetry and masticatory function [5,6].

Osseointegrated dental implants provide a treatment modality that may adequately rehabilitate oral functions of these patients so that they can lead a healthy life [3]. However, this is an expensive modality which may not be acceptable to all strata of patients. In this case the guidance prosthesis was not planned because a time period

of 1 year had elapsed and scar tissue formation had occurred and guiding flange prosthesis is contraindicated in that scar tissue.

Twin occlusion was provided because the patient could not occlude on the natural teeth. The palatal row of teeth occluded with the remaining natural mandibular teeth and the buccal row of natural teeth supported the cheeks. This technique enables the patient to masticate appropriately, to lead a healthy, good quality of life. It helps patient to deal with the physical and psychological disabilities.

Conclusion

Hemimandibulectomy patients are the difficult patient to manage because prosthodontist is limited in their ability to provide a reasonable and occlusal scheme, these patients are best treated with uncomplicated prosthesis. Since most patients undergoing hemimandibulectomies are from less socioeconomic favored population, the recent and better treatment options such as implant and bone grafting are not feasible. In this case the guidance prosthesis was not planned because a time period of around 1 year had elapsed and scar tissue formation had occurred. Twin occlusion was provided because the patient could not occlude on the natural teeth. This technique enables the patient to masticate appropriately, to lead a healthy, good quality of life. It helps patient to deal with the physical and psychological disabilities.

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