Case Report

Twin-Occlusion Prosthesis: A Glimmer of Hope for Hemimandibulectomy Patient

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Abstract

Mandible, the lower jaw, creates peripheral boundaries of floor of the oral cavity, and it is the most common site for intraoral tumors which often require the resection of their large portions. Loss of continuity of the mandible leads to deviation of the residual segment toward the surgical site and alteration in muscle function. This results in facial asymmetry and malocclusion. Numerous prosthetic methods are employed to minimize deviation and improve masticatory efficiency, which include implant-supported prosthesis and palatal-based guidance restorations. This case report describes the rehabilitation of a hemimandibulectomy patient using twinned teeth (two rows of teeth) arrangement.

Keywords: Hemimandibulectomy, mandibular deviation, paired teeth, twin occlusion

Introduction

Oral cancer is the sixth most common cancer worldwide.[1] More than 90% of all oral cancers are squamous cell carcinoma (SCC).[2,3] The most important risk factors for oral SCC are use of tobacco or betel quid and regular drinking of alcoholic beverages. Unfortunately, most of these lesions are diagnosed at a late stage and require surgical resection along with adjacent anatomical structures such as mandible, floor of the mouth, and tongue.

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, of which the most significant difficulty encountered is mandibular deviation toward the defective side.[4] It is reported in the literature that hemimandibulectomy patients managed with their disability by using their proprioceptive feedback to balance for deviation toward the resected side. The main treatment objective in hemimandibulectomy cases is to reestablish an acceptable occlusal relationship for the residual dentition which provides sufficient masticatory efficiency.[5,6]

Cantor and Curtis provided a hemimandibulectomy classification for edentulous patients that can also be applied in partially edentulous arches.[7] In patients where reconstruction is not done after resection of the mandible, scar tissue formation occurs over a period of time that stiffens the tissues and worsens prosthetic rehabilitation, leading to compromised treatment planning. In the present case after resection, reconstruction was not done, so the amount of deviation was great. Furthermore, the patient was partially edentulous in the maxillary arch representing Kennedy’s Class II and a sufficient number of teeth were not present in the mandibular arch.

This case report highlights prosthetic rehabilitation of a hemimandibulectomy patient for whom a mandibular guide flange prosthesis or palatal ramp prosthesis cannot be fabricated.

Case Report

A 62-year-old male patient reported to the department of prosthodontics with a chief complaint of difficulty in chewing food for 2 months. His medical history revealed that he was diagnosed for SCC on the left side of the mandible, for which he had undergone extensive resection of the entire mandible on the left side with part of the anterior mandible on the right.

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side 6 years back. The patient’s habit revealed that he was a tobacco chewer, 10–12 packets per day for 36 years. An extraoral examination showed asymmetrical face and a convex profile. There was deviation of the mandible to the left side that is toward the resected side [Figures 1 and 2].

**Clinical procedure**

Primary impressions were made in irreversible hydrocolloid alginate for both maxillary and mandibular arches and poured in dental stone [Figure 3]. On the mandibular cast, a custom tray was fabricated with self-cure acrylic resin (RR, Dentsply, India), and borders were recorded by performing border molding [Figures 4 and 5]. Final impression was made with polyether, and the impression was poured with die stone to obtain a master cast [Figures 6 and 7]. Maxillary and mandibular casts were articulated on the three-point nonadjustable mean value articulator on the basis of occlusion of the right side [Figure 8]. After articulation, two sets of anatomic teeth (Premadent, New Delhi, India) were selected. Two rows of teeth were arranged for the edentulous maxilla. The first row of teeth was arranged as per contour of the patient’s ridge, and the other set was arranged palatal to the first row on which the mandibular teeth occlude. The palatal row of the arranged maxillary teeth was placed in occlusion with the buccally placed teeth in the edentulous mandible. Denture was processed in the usual manner. After processing, remounting has been done and on occlusal surface selective grinding was done to have the proper occlusal contact of the teeth. The denture was finished and polished [Figures 9 and 10].

The patient was given postinsertion instructions and was motivated to make efforts to learn to adapt to the new dentures.

**Discussion**

The reasons for segmented resected mandible are multifactorial with several collateral problems which alter prosthetic prognosis. However, the four significant factors that affect the amount of prosthetic rehabilitation include the site and extent of surgery, the effect of radiation, presence or absence of teeth, and psychological impact. The basic objective of rehabilitation is training the remaining mandibular muscles to stabilize the mandibular denture by providing an acceptable maxillary–mandibular relationship. The tissue in the surgical region is scarred, uneven, without support of the bone, and movable in various degrees. These features make the area unsuitable to be covered by an appliance or to receive loading. The frontal plane rotation occurs due to loss of proprioceptive...
sense of occlusion, which leads to uncoordinated and less precise movement of the mandible. In addition, due to attachment loss of muscles of mastication on the surgical side, there is significant rotation of the mandible upon forceful closure.

This clinical report illustrates the prosthetic management of a patient who underwent hemimandibulectomy. Literature review advocates fabrication of guide flange or palatal ramp prosthesis for such patients to prevent deviation of the mandible and to improve masticatory function and esthetics. Since a considerable period of time had elapsed after the surgical procedure, scar tissue formation had occurred and guidance prosthesis was not possible. Thus, a prosthesis was fabricated with an arrangement of two rows of teeth because the patient could not close his mouth in proper intercuspation and hence could not masticate. After insertion of the prosthesis, the patient could intercuspate mandibular teeth properly due
to twin maxillary occlusal table. The patient was kept on 6 months' recall. After 1 week, the patient reported an increase in masticatory efficiency.

**Conclusion**

A hemimandibulectomy can have many debilitating consequences, such as disturbed occlusion, a disoriented masticatory cycle, facial disfigurement, distorted speech, and salivation problems. Guide flange prosthesis is the most common treatment option in such cases, but in cases where a sufficient number of teeth are not present and where deviation is massive, providing twin occlusion rehabilitates the patient functionally.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

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