Twin Occlusion: A Solution to Rehabilitate Hemi-mandibulectomy Patient-A Case Report

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Abstract
Mandible is a single bone that creates peripheral boundaries of the floor of mouth, establishes facial form, helps in speech, swallowing, mastication and respiration. Disruption of the mandible has the potential to disrupt any of these functions. Segmental resection of the mandible commonly results in the deviation of mandible towards the defective side. The amount of deviation depends on the amount of hard and soft tissue involvement, method of surgical site closure, degree of impaired tongue function, number of remaining teeth and the extent of loss of sensory and motor innervations. Prosthodontic treatment along with physical therapy may be useful in reducing mandibular deviation and improving masticatory efficiency. This clinical report describes a case with severe deviation and the use of two rows of teeth on the unresected side. This provided a broader occlusal table and improved masticatory efficiency in an edentulous madibulectomy patient.

Introduction:
Rehabilitation of mandibulectomy patients should consider both form and function. Functional rehabilitation of a patient who has a partially resected mandible is one of the most challenging procedures confronting the maxillofacial prosthodontist. Loss of continuity of the mandible destroys the balance of the mandibular movement and function, leading to altered mandibular movement and deviation of the residual fragment towards the surgical side. The greater the loss of tissue, greater will be the deviation of the mandible to the resected side, thus compromising the prognosis of the treatment. Apart from deviation of mandible to resected site, other dysfunctions observed are difficulty in mastication, swallowing, speech, mandibular movements, and even respiration.

Cantor & Curtis provided a hemimandibulectomy classification for edentulous patient that can also be applied in partially edentulous arches. In cases with class II, III, IV, and V guide flange
prosthesis would be a treatment modality. For guide flange prosthesis to be effective sufficient number of posterior teeth that are periodontally sound should be present in the opposite arch. 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. Also the patient was partially edentulous in the maxillary arch representing Kennedy’s class I and sufficient number of teeth were not present in the mandibular arch. So the fabrication of guide flange prosthesis was not possible. This article highlights Prosthetic rehabilitation of a hemimandibulectomy patient for whom a mandibular guide flange prosthesis or palatal ramp prosthesis cannot be fabricated.

Case Report
A 65 year old male patient reported to the Department of Prosthodontics, Government Dental College, Srinagar with a chief complaint of difficulty in mastication since 3 months (Figure1). His medical history revealed that he was diagnosed for squamous cell carcinoma on the left side of the mandible, for which he had undergone extensive resection of the mandible on left side. The patient’s habit revealed that he was a tobacco chewer. An extra oral examination showed asymmetrical face, and a convex profile. There was deviation of the mandible to the left side that is towards the resected side. Patient’s dental history revealed that he was wearing complete denture in upper and lower arch. On palpation the mandibular ridge was present till canine region and remaining ridge was resected on left side. Maxilla was completely edentulous.

Clinical Procedure:
Preliminary impressions were made with irreversible hydrocolloid material using stock trays and casts were poured with type III dental stone. Custom tray was fabricated with self-cure acrylic resin and border molding was performed. Final impression was made with zinc oxide eugenol impression paste. Impressions were poured with type III dental stone to obtain a master cast. Denture base was fabricated and wax occlusal rim was made. Maxillary master cast was articulated using a face bow on a semi adjustable articulator. Maxillomandibular relations were recorded. The patient’s tactile sense or sense of comfort was used to assess the vertical dimension of occlusion. The patient was advised to move his mandible as far as possible to the unaffected side and then gently close his mandibular jaw into position to record a functional maxillomandibular relationship. After articulation, two sets of teeth were selected. Two rows of teeth were arranged for the posterior region of edentulous maxilla on the unaffected side. First row of teeth were arranged as per contour of the patients ridge and the other set were arranged palatal to the first row on the unaffected side in the maxillary arch on which the mandibular teeth will occlude. Occlusal surfaces of these teeth were ground so as to obtain intimate contact with the opposite tooth and to provide freedom of movement in the lateral direction. Arrangement was verified during try in and denture processed, finished and polished (Figure 2).

Discussion
This article highlights functional rehabilitation of hemimandibulectomy patient who has undergone resection without reconstruction. 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 aesthetics. Since a considerable period of time had elapsed after the surgical procedure, scar tissue formation has occurred and guidance prosthesis was not possible. Apart from this, guide flange therapy is most successful in patients where resection involves only bony structures with minimal sacrifice of tongue, floor of the mouth, and adjacent
soft tissue\textsuperscript{1, 6}. Hence we fabricated a conventional maxillary removable partial prosthesis with two rows of teeth—twinned occlusion\textsuperscript{5, 7}. Two rows of teeth were arranged because the patient could not close in proper intercuspation and hence could not masticate. The palatal row of teeth intercuspated with the remaining mandibular teeth and the buccal row of teeth supported the cheeks\textsuperscript{8}. After insertion of the prosthesis the patient could intercuspate mandibular teeth properly due to twin maxillary occlusal table (Figure 5). The patient was kept on 6 months recall. After 1 week the patient reported an increase in masticatory efficiency and seemed happy with the treatment (Figure 3).

**Conclusion**

In patients with mandibular resection the prognosis of any prosthesis is guarded. This present article illustrates functional rehabilitation of hemimandibulectomy patient, who had undergone resection without reconstruction. Guide flange prosthesis is the most common treatment modality in such cases but in cases where sufficient numbers of abutment teeth are not present and where deviation is massive, providing twin occlusion, rehabilitates the patient functionally. Improved mastication on the non-resected side with a removable prosthesis is a reasonable objective than expensive implant therapy.

**References**

Figures

Figure 1

Figure 2

Figure 3