

Occlusal guiding flange prosthesis for management of hemimandibulectomy- a case report

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ABSTRACT

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Surgical resection of the mandible due to presence of benign or malignant tumor is the most common. Depending upon the location and extent of the tumor in the mandible, various surgical treatment modalities like marginal, segmental, hemi, subtotal, or total mandibulectomy can be performed. Mandibular discontinuity defects present a major challenge to the rehabilitation team and to maxillofacial prosthodontist. Discontinuity of mandible after resection destroys balance and symmetry which leads to altered mandibular movements and deviation of the residual fragment towards the defective side. Variety of materials and techniques have used for the construction of prosthetic replacement of the acquired surgical defects.

This case report describes prosthodontic management of a patient who has undergone hemi-mandibulectomy with mandibular guide flange prosthesis. To aid in moving the mandible normally without deviation during functions like speech and mastication.

Keywords: Hemimandibulectomy, Guiding flange, Maxillofacial prosthesis

INTRODUCTION

Variety of materials and techniques have used for the construction of prosthetic replacement of the acquired surgical defects. The cosmetic, functional, and psychosocial results of oral cancer treatment may affect variety of functions, including speech, deglutition, management of oral secretions, and mastication. Thus, maxillofacial prosthetic rehabilitation helps to restore the head and neck cancer patient's oral functions and cosmetics following surgery.¹ Acquired defects of the orofacial structures must be analyzed as to the specific cause and the consequent objectives of rehabilitation. Mandibular discontinuity defects present a major challenge to the rehabilitation team and to maxillofacial prosthodontist. Discontinuity of mandible after resection destroys balance and symmetry which leads to altered mandibular movements and deviation of the residual fragment towards the defective side. This would hamper the aesthetic and psychological comfort along with masticatory function².

A ram or guide plane to maxillary teeth that oppose the non resected side of mandible helps patient to achieve consistent closure to an intercuspal position. Guide flange prosthesis (GFP) is a mandibular conventional prosthesis designed for the patient who has undergone hemimandibulectomy and able to

achieve an appropriate mediolateral position of the mandible but is unable to repeat this position consistently for adequate mastication². Guiding Flange made of acrylic polymers which lacks the principles of Removable Partial Denture design may affect the longevity of the remaining teeth. This case report describes prosthodontic management of a patient who has undergone a hemimandibulectomy².

CASE REPORT

A 39 year old male reported to the Department of prosthodontics with a chief complaint of difficulty in mastication and speech. He had a unilateral discontinuity mandibular defect on the right side due to surgery for squamous cell carcinoma. The surgery was performed 8 months back followed by radiation. Extraoral examination showed facial asymmetry with mandibular deviation to the right side (Fig-1,2). Clinical examination revealed severe deviation of the mandible towards the resected side, with lack of proper contact between the maxillary and the mandibular teeth. Intra oral examination showed missing teeth in the right side of mandible.

The mandibular defect was classified as Cantor and Curtis Class VI i.e. resection of the lateral portion of the mandible without subsequent augmentation to restore form and function³. A maxillary and mandibular impression was made by using irreversible hydrocolloid. The casts were poured with Type III dental stone (Fig-3). A maxillomandibular record was made by manually assisting the mandible into the centric occlusion. The maxillary and mandibular cast was mounted on a articulator.

The prosthesis was fabricated on the non defect (left) side. The design included the guidance flange on the buccal side and the supporting flange on the lingual side. The retention was provided by the interdental

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clasp, engaging the premolars and the molars (Fig-4). The guide flange extended superiorly and diagonally on the buccal surface of the molars and the premolars, allowing the normal horizontal and vertical overlap of the maxillary teeth (Fig-5). The guide flange was sufficiently blocked out, so that it would not traumatize the left maxillary teeth and the gingiva when the patient closed his mouth. Care should be taken to preserve the buccal-surface indentations of the opposing maxillary teeth which were guiding the mandible in a final definite closing point during mastication. The flange height was adjusted in such a way that it guided the mandible from large opening position (in practical limits of the height of the buccal vestibule) to the maximum intercuspation in a smooth and unhindered path. The prosthesis was delivered and post-insertion instructions were given.



Fig. 3: impressions of the remaining mandibular teeth



Fig. 1: front profile of patient



Fig. 4: guiding flange appliance with retentive clasp



Fig. 2: lateral profile of patient



Fig. 5: buccal extension of GFA

DISCUSSION

Complete rehabilitation of a hemi -mandibulectomy case is a challenging task, especially due to the lack of bony foundation on the surgical side. Loss of mandibular continuity causes deviation of remaining mandibular segment(s) towards the defect and rotation of the mandibular occlusal plane inferiorly. Mandibular deviation toward the defect side occurs primarily because of the loss of tissue involved in the surgical resection.²

When a segment of the mandible is removed, immediate reconstruction is usually recommended to improve both facial symmetry and masticatory function. Although techniques for reconstructive surgery and prosthodontic rehabilitation have advanced, more than 50% of reconstructed head and neck cancer patients still report impaired masticatory function. The GFP can be regarded as a training type of prosthesis. If the patient can successfully repeat the mediolateral position, the GFP can often be discontinued.⁴

Support for the GFP is no different from that of any other removable prosthesis, the natural teeth and the residual alveolar ridge being the primary sources. Multiple retentive clasps in widely distributed areas of the arch would be the best approach, but actual placement would be determined by the position of the teeth. Retentive elements should be no more rigid than necessary, but they require a more rigidity with a decreasing number of teeth.^{4,5}

CONCLUSION

Our main aim was to fabricate interim training device to guide mandible to unassisted maximum occlusal contacts. The success of hemimandibulectomy rehabilitation depends on the nature of surgical defect, patient's cooperation and prosthetic management with early physiotherapy program. The presence of teeth in both the arches creates a better proprioceptive sense and the prosthesis which re-educates the mandibular muscles to re-establish an acceptable occlusal relationship will control the opening and closing of the mandibular movements adequately and repeatedly.

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