

Prosthodontic Management of Acquired Mandibular Defect by Functionally Moulded Palatal Ramp Prosthesis - A Clinical Report

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ABSTRACT

Oral carcinomas which include mandible often require surgical management and results in loss of continuity, and hampers balance and symmetry of mandibular function. Prosthodontic treatment in patients with hemimandibulectomy should be aimed at improving masticatory efficiency by minimizing deviation of mandible towards the defect side. Successful intercuspal position with the opposing arch teeth is accomplished by functionally molded palatal guidance appliance. This article describes the rehabilitation of a hemimandibulectomy patient with a palatally placed guiding prosthesis which aids in minimizing deviation and improves mastication and speech.

KEYWORDS: Hemimandibulectomy, Palatal Ramp, Squamous Cell Carcinoma, Rehabilitation

INTRODUCTION

Malignancies of maxillofacial region are most common etiology for the acquired defects of that region.¹ Oral squamous cell carcinoma is the most common cancer in India, and its prevalence ranges around 45% of all cancers. Unfortunately, most of these lesions are diagnosed at a late stage and requires surgical resection along with adjacent anatomical structures such as mandible, floor of the mouth, tongue, etc.

Loss of mandibular continuity results in cosmetic, functional and psychological discomfort for the patient. If condylectomy has been performed the prime most difficulty encountered is deviation of mandible towards the defect side, and inferiorly.² Rotation of mandible medially and inferiorly is mainly due to pull of supahyoid muscles, loss of ligaments of the temporomandibular joint which allows the mandible to fall vertically from the normal position.³ The amount of deviation may be depend upon the extent of the resection. This results in facial asymmetry and altered muscle function. Masticatory function is compromised because of altered maxillomandibular relation, loss of occlusal contact because of deviation results in difficult chewing.⁴

The main treatment objective in hemimandibulectomy cases is to reestablish an acceptable occlusal relationship for the residual dentition which provides sufficient masticatory efficiency. Various prosthesis designs are there either mandibular based or palatally based in order to re establish the occlusion.^{5,6} These appliances should always accompany by self- corrective exercises by the patient like moving the mandible away from the surgical site. The present case report describes the fabrication of

palatal ramp type guiding appliance for hemimandibulectomy patients which limit the deviation of mandible towards the surgical side and to provide masticatory function. The patient can use this device all the day except while eating.

CASE REPORT

A 53- yr -old male patient reported to the department of prosthodontics, G.Pulla reddy dental college, Kurnool with a chief complaint of difficulty in eating and altered facial appearance following left mandibular hemimandibulectomy. Patient gave a medical history of squamous cell carcinoma in left mandibular posterior region and was treated by surgical resection of the mandible on the affected side followed by radiotherapy and chemotherapy one year back. The resection surgery was not followed by reconstructive surgery to replace the bony continuity.

An extra oral examination showed asymmetry of the face and convex profile and deviation of mandible towards the resected side. (Fig 1, 2) Evaluation of orthopentamogram of the patient revealed absence of mandible on the left side. An intra oral examination showed partially edentulous maxillary arch. Teeth missing in maxillary arch were 11, 16, 17, 21, 26, and 27. Root stump in relation to 15 was advised for extraction. In mandibular arch teeth were absent on the resected side. (Fig 3) There was no occlusion on the right side with intact dentition, and a deviation of about 5mm was noticed. As the resection was not followed by reconstruction, there was complete obliteration of vestibule on the resected side with scar tissue formation.

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Fig 1: Pre operative frontal view of the patient after hemimandibulectomy



Fig 2: Pre operative frontal view of the patient showing deviation of mandible towards the resected side



Fig 3: Intraoral view showing the resected mandible and scar

Primary impressions were made in alginate for both maxillary and mandibular arches and poured in dental stone. On the maxillary cast, a custom tray was fabricated, and borders were recorded by performing border moulding. Final impression was made in zinc oxide eugenol impression paste and was followed by

pick up impression with a stock tray.(Fig 4) Impressions were poured in dental stone to obtain a master cast. Base plate was fabricated on maxillary cast in self cure acrylic resin. On this self cure acrylic resin in dough stage was added on the right side of the base plate extended inferiorly and diagonally on the palatal aspect of remaining maxillary dentition on right side. (Fig 5) The mandible was manipulated to the desired occlusal relationship. The self cure resin was placed to extend 8-10mm inferiorly. The mandibular movements were repeated for several times and necessary manipulations were done to allow the mandibular teeth to glide over the lateral aspect of the ramp, and the resin was allowed to polymerize. Bite registration and wax try in was performed to replace the missing maxillary teeth.(Fig 6) The entire pattern was invested by conventional flasking ,dewaxing done and packed in heat cure acrylic denture base resin. The prosthesis was finished and polished. (Fig 7)The patient was recalled for insertion and the prosthesis was checked for retention and stability. Following insertion it was verified that mandible is closing in a satisfactory position and interferences were removed to allow smooth gliding over ramp. (Fig 8) Instructions were given regarding maintenance. Stretching exercises were suggested for the patient to manipulate the mandible into the desired position.



Fig 4 : Impressions of the maxillary and mandibular arches

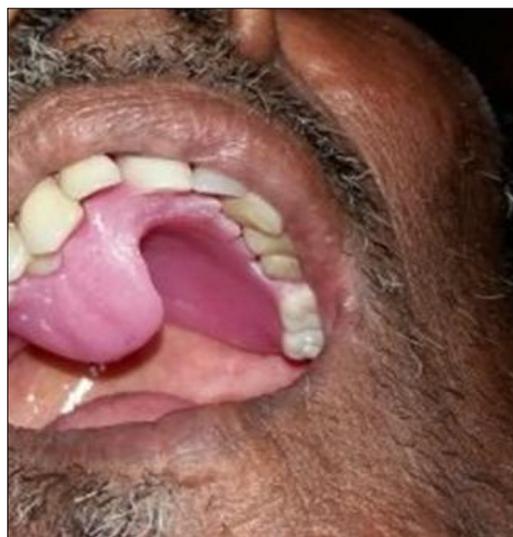


Fig 5: Self cure acrylic resin was added on the palatal aspect of the maxillary posteriors of the unresected side.



Fig 6: Wax try in of the prosthesis by manipulation of mandible .



Fig 7: Final Prosthesis with palatal ramp



Fig 8: Definitive intra oral result

DISCUSSION

Various surgical treatment modalities which include marginal, segmental, hemi, subtotal, total mandibulectomy depending upon the extent of tumor in cases of oral malignancies. The final outcome of surgical

treatment is loss of occlusal contact and facial disfigurement which results in functional limitation. In mandibulectomy cases, the prosthetic rehabilitation should be started as soon as possible to limit the deviation of mandible and should be accompanied by stretching exercises by the holding the chin and moving the mandible away from the resected side .This can be started during the postoperative healing period 2 weeks after surgery.⁷ In this case, considerable period of time had elapsed following surgery. Scar tissue formation had occurred on the resected side.

Chalian et al.⁸ described cast metal guidance prosthesis with retentive flanges for patient after hemimandibulectomy. Guide flange prosthesis is mostly recommended in patients for all patients with significant resection of mandible deviation of mouth opening and with tissue scarring .

In this present case, the palatal ramp was fabricated on the palatal aspect of the maxillary partial denture such that the occlusal surface of lower teeth glides freely over the slope of the balancing ramp minimizing the amount of deviation during mandibular closure. The principle objective of glide flange prosthesis is to re educate the mandibular muscles in achieving the correct mediolateral relationship along with maintenance of esthetics and function. No type of appliance will serve for every patient; basic design of the appliance will depend on postoperative findings. The basic patient requirements like function and esthetics should be satisfied with the design of the appliance.

CONCLUSION

In hemimandibulectomy patients, prognosis of any prosthesis is guarded. This present article illustrates the rehabilitation of a hemimandibulectomy patient with a functionally moulded palatally positioned guide ramp prosthesis which had undergone resection without reconstruction. This prosthesis minimized the deviation of mandible towards the defect side and associated problems by improving the mastication and speech.

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