

Case Report**Prosthetic Management of Edentulous Mandibulectomy Patient with Modified Occlusion - A Case Report**

Mahajan T, Trivedi R, Singh S, Sangur R

**Abstract:** Prosthetic management of surgical defects is a big challenge for a prosthodontist. Hemimandibulectomy patient presents with many problems because of deviation of mandible on affected side. This incapacitation depends upon the amount of hard and soft tissue resected, remaining dentition and tongue mobility for mastication and other oral functions. It is essential to restore the oral function in such patients to ensure for an ability to have healthy diet and overall general health. The treatment options for such patients are surgical restoration of resected part, physiotherapy or prosthodontic intervention. This article presents a case of prosthetic rehabilitation of an edentulous hemimandibulectomy patient with a modified arrangement of teeth in the maxillary denture on the unresected side to occlude maximally with the deviated mandible.

**Key words:** Hemimandibulectomy; Squamous cell carcinoma; Denture; Prosthodontic; Mastication; Oral.

**INTRODUCTION**

Surgical treatment for malignant tumours of the oral cavity often requires resection of the mandible, floor of the mouth, tongue and also the palate.<sup>1,2</sup> Loss of mandibular continuity after surgical treatment leads to altered muscle function and deviation of residual fragment towards the surgical side.<sup>3</sup> Apart from deviation other dysfunction noted are difficulty in mastication, swallowing, speech, mandibular movements, and even respiration.

Prosthodontic rehabilitation of a patient with mandibulectomy restores the balance and symmetry of face. In patients with extensive soft tissue loss resulting in tight wound closure and scar tissue contracture leads to the most severe mandibular deviation and dysfunction making the prosthetic prognosis compromised.<sup>4</sup>

This article presents a case of prosthetic rehabilitation of an edentulous hemimandibulectomy patient with a modified arrangement of teeth in the maxillary denture on the unresected side to occlude maximally with the deviated mandible.

**CASE REPORT**

A 75 year old, completely edentulous, male patient was referred to the Department of Prosthodontics. He complained of difficulty in chewing and speaking. The patient's history indicated that he had a tobacco-chewing habit since 30 years. He was

diagnosed with squamous cell carcinoma of the right buccal mucosa about two years back.

His medical history revealed that he had undergone an extensive resection of the mandible distal to the right lower canine region, together with radical neck dissection about 2 years ago. An extraoral examination showed an asymmetrical face, concave profile and an ovoid face (Fig 1). There was deviation of the mandible to the right side. On palpation, the ridge on the right lower site was found to be present only till the first premolar region (Fig 2). An orthopantomogram (OPG) revealed resection of the mandible distal to the lower canine involving the ramus, coronoid process and condyle. This represented class II type of resection according to the Cantor and Curtis classification.<sup>5</sup>

**Procedure**

Preliminary impressions were made with irreversible hydrocolloid material (Zelgan2002, Dentsply) using stock trays. Impressions were poured with type III dental stone (Kalabhai Pvt Ltd, India). On maxillary cast conventional custom tray was fabricated with self-cure acrylic resin (DPI – RR, India), on mandibular cast custom tray was fabricated only on the unresected side (Fig 3). Border moulding 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 (Fig 4). Denture bases were fabricated and occlusal rims were made. In maxilla, the wax rim used to record the centric occlusion registration was widened on the unresected side towards the palatal side in order to account for deviation of the mandible. Problems such as altered proprioceptive mechanism, trismus, mandibular deviation, impaired motor and sensory function, muscle imbalance makes vertical dimension of occlusion difficult to determine. Maxillo-mandibular relation were recorded, patient's tactile sense of comfort was used to assess the vertical dimension of occlusion. Patient was advised to move his mandible as far as possible towards unresected side and gently close his mandible into position to record a functional

maxilla-mandibular relationship. Both the casts were mounted. Semi-anatomic teeth were arranged for the posterior region of edentulous maxilla on unaffected side, slightly palatal to the ridge contour to occlude with the mandibular teeth (Fig 5 & 6). Arrangement was verified during try-in and denture was finished and polished in conventional manner (Fig 7). Any interference in normal movements was corrected. Mastication was confined exclusively to the non-defect side. The patient was given post insertion instructions and was motivated to make efforts to learn to adapt to the new dentures (Fig 8). After insertion of the denture, patient reported an increase in masticatory efficiency and happy with the treatment. The patient was kept on 6 months recall.



Figure 1: Extraoral view



Figure 3: Custom trays



Figure 2: Intraoral view



Figure 4: Master Casts



Figure 5: Modified teeth arrangement



Figure 6: Articulated casts in occlusion



Figure 7: Final dentures

Figure 8: Intraoral view with dentures

## DISCUSSION

According to Olson ML et al<sup>6</sup> in 1978 and Curtis DA et al<sup>7</sup> in 1997, resected part of mandible should be immediately reconstructed to recover both facial symmetry and masticatory function.

### Cantor and Curtis classification for Hemimandibulectomy<sup>5</sup>:

**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.

The presented report is a Class II hemimandibulectomy case. It is reported that even the recent developments in reconstructive surgery and prosthodontic rehabilitation have not been able to restore impaired masticatory function in 50% of head and neck cancer patients.

Segmental mandibulectomy as surgical treatment for squamous cell carcinoma results in deviation of the remaining mandibular segment toward the defect and rotation of the mandibular occlusal plane inferiorly. Rotation is caused by the pull of the suprahyoid musculature on the residual mandibular fragment causing inferior displacement and rotation around the fulcrum of the remaining condyle<sup>8</sup>. Gravity, loss of continuity, loss of anchorage, loss of temporomandibular ligaments allows the mandible to fall vertically away from the normal position. The frontal plane rotation occurs due to loss of proprioceptive sense of occlusion, which leads to un-coordinated and less precise movement of the mandible.

Also, because of the absence of attachment of the muscles of mastication on the surgical side, there is significant rotation of the mandible upon forceful closure. When the force of closure increases, the remaining mandible actually rotates through the frontal plane.<sup>1</sup>

Osseointegrated dental implants can adequately rehabilitate oral functions of such patients so that they can lead a healthy life.<sup>9</sup> But, this is an expensive treatment option which may not be affordable to all strata of patients.

**CONCLUSION:** This article presents functional rehabilitation of hemimandibulectomy patient, who has undergone resection without reconstruction. The patient was completely edentulous on both the arches. Hence, fabrication of conventional removable complete denture prosthesis with a modified arrangement of teeth in the maxillary denture on the unresected side to occlude maximally with the deviated mandible was done.

**Author affiliation:** 1. Dr. Tanu Mahajan, MDS, Professor, 2. Dr. Roopsi Trivedi, PG Student, 3. Dr. Saurabh Singh, PG student, 4. Dr. Rajashekar Sangur, MDS, Professor & Head, Department of Prosthodontics, Rama Dental College-Hospital & Research Centre, Kanpur, Uttar Pradesh, India.

#### REFERENCES

1. Beumer J, Marunick MT, Curtis TA, Roumanas E. Acquired defects of the mandible. In, Beumer J(ed). Maxillofacial Rehabilitation: Prosthodontic and Surgical Consideration, 1<sup>st</sup> edition. St. Louis. Euro America, 1996;201.
2. Jacob RF. Prosthodontic rehabilitation of the mandibulectomy patient. In, Taylor TD(ed). Clinical Maxillofacial Prosthetics, 1<sup>st</sup> edition. Illinois. Quintessence Publishing, 1997;171-172.
3. Shetty P, Baliga M, Rodrigues S, Dixit S. Prosthetic management following mandibular resection: clinical report. J Nepal Dent Assoc 2009;10:57-60
4. Beumer J, Marunick MT, Curtis TA, Roumanas E. Acquired defects of the mandible. In, Beumer J(ed). Maxillofacial Rehabilitation: Prosthodontic and Surgical Consideration, 1<sup>st</sup> edition. St. Louis. Euro America, 1996;236.
5. Cantor R, Curtis TA. Prosthetic management of edentulous mandibulectomy patients: Part II, Clinical procedures. J Prosthet Dent 1971; 25:546-555.
6. Olson ML, Shedd DP. Disability and rehabilitation in head and neck cancer patients after treatment. Head Neck Surg 1978;1:52-58.
7. Curtis DA, Plesh O, Miller AJ, Curtis TA, Sharma A, Schweitzer R, Hilsinger RL, Schour L, Singer M. A comparison of masticatory function in patients with or without reconstruction of the mandible. Head Neck 1997;19:287-296.
8. Korlakunte PR, Shammur SN, Iynalli RV, Shivmurthy S. Prosthetic management of hemimandibulectomy patient with guiding plane and twin occlusion prosthesis. J Nat Sci Biol Med 2015; 6(2): 449-453.
9. Patil PG, Patil SP. Guide flange prosthesis for early management of reconstructed hemimandibulectomy: a case report. J Adv Prosthodont 2011;3:172-176.

#### Corresponding Author:

Dr. Roopsi Trivedi,  
Department of Prosthodontics,  
Rama Dental College-Hospital & Research  
Centre, Kanpur, Uttar Pradesh, India.  
Contact no: 8935028992  
Email ID: [roopsi2519@gmail.com](mailto:roopsi2519@gmail.com)

**How to cite this article:** Mahajan T, Trivedi R, Singh S, Sangur R. Prosthetic Management of Edentulous Mandibulectomy Patient with Modified Occlusion - A Case Report. Rama Univ J Dent Sci 2015 Dec;2(4):42-45.

**Sources of support:** Nil

**Conflict of Interest:** None declared