

Prosthetic Rehabilitation of Hemimandibulectomy Patient

¹Sandeep Yadav, ²Aman Arora

¹Postgraduate Student, Department of Prosthodontics and Crown and Bridge, DAV Dental College and Hospital Yamunanagar, Haryana, India

²Professor and Head, Department of Prosthodontics and Crown and Bridge, DAV Dental College and Hospital Yamunanagar, Haryana, India

Correspondence: Sandeep Yadav, Postgraduate Student, Department of Prosthodontics and Crown and Bridge, House No. 94 Block B-1, Sector 11, Faridabad-121006, Haryana, India, Phone: 09354181312, 01294108733, e-mail: mailtodrsandeep@yahoo.co.in

ABSTRACT

Rehabilitation of patients with mandibular defect requires a multidisciplinary approach involving a head and neck surgeon, maxillofacial prosthodontist and a reconstructive surgeon. A hemimandibulectomy patient can have many debilitating consequences such as eccentric occlusion, disoriented masticatory cycle, facial disfigurement, distorted speech and salivation problem. The aim of this case report is to describe a technique which combines crown with prosthetic rehabilitation to meet the functional and esthetic requirement of the hemimandibulectomy patients.

Keywords: Hemimandibulectomy, Metal framework, Prosthetic rehabilitation, Malignancy.

INTRODUCTION

The prosthodontic rehabilitation of patients with acquired mandibular defect is a challenging task for a dentist. With continued improvement in surgical resection and reconstruction techniques, the prognosis for these patients has greatly improved. Prosthodontic management of patient with mandibulectomy defects can enhance appearance, function and speech.¹

The unilateral loss of mandibular continuity due to surgery or trauma results in mandibular deviation toward the defect side. The reason for this deviation is multifactorial and includes the location and extent of the resection, the amount of soft tissue involvement, the degree to which innervation has been involved, how tightly the surgeon has closed the wound and the presence of remaining natural teeth. The extent of mandibular resection and loss of continuity is directly related to the decreased masticatory function.²

Prosthetic methods, including intermaxillary fixation, mandibular based guidance restorations, and palatal-based guidance restorations will reduce or minimize mandibular deviation.² Fattore³ et al advocated a two pieces Gunning's splint both for intermaxillary fixation and as a guidance appliance for an edentulous patient following hemisection of the mandible. A well organized mandibular exercise program should support these methods. McCasland⁴ suggested that patients use straight opening and closing exercise to train the neuromuscular system to avoid deviation of the mandible.

Brown⁵ stated that edentulous patients who have experienced mandibular resection with no recurrence for a year are candidates for prosthetic treatment. The following paper describes a technique which combines crown with

prosthetic rehabilitation to meet the functional and esthetic requirement of such patients.

CASE REPORT

A 64-year-old male patient reported to the Department of Oral Surgery in DAV (C) Dental College, Yamunanagar, Haryana with the complaint of pain on chewing, burning sensation and swelling on left side of the face. There was no suggestive history of smoking, alcoholism or any systemic disease. On the basis of clinical and radiographic examination a provisional diagnosis of dysplasia/malignancy was made. Histopathological report was suggestive of squamous cell carcinoma and patient went for surgical resection of the same. During surgery some of his compromised teeth had to be extracted. After 6 months of surgery, when healing was complete, prosthetic rehabilitation was advised (Fig. 1). On intraoral examination, it was found that vestibule was obliterated on operated site due to wound contracture, oral mucosa was inelastic, limited number of teeth were present, mouth opening was restricted (about 2 fingers) and there was no acceptable mandibular deviation. On radiographic (Fig. 2) and clinical examination it was found that few more teeth were in compromised condition which could have affected the treatment outcome adversely. So, it was decided to extract them and fabrication of the partial denture was planned to improve some degree of masticatory ability and general appearance of the patient.

PROCEDURE

Preliminary impressions were made with irreversible hydrocolloid (Alligat chroma, Heraeus Kulzer, Germany) and poured



Fig. 1: Postsurgical photograph



Fig. 4: Final cast upper and lower arch

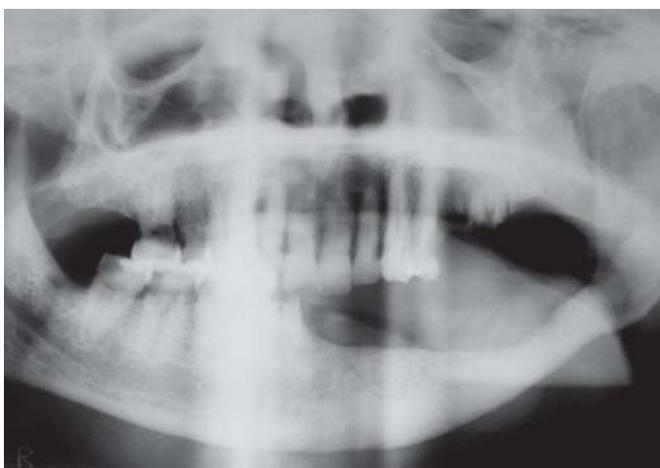


Fig. 2: Orthopantomograph



Fig. 5: Final denture



Fig. 3: Final impression upper and lower arch



Fig. 6: Intraoral view of final prosthesis

with type III dental stone to obtain primary cast. Surveying was done and design of lower metal framework was planned. In mandibular right 1st premolar, a full metal crown, Ni-Cr, (Wiron 99, Bego, Germany) was fabricated and PFM crown, with porcelain facing (IPS d. Sign, Ivoclar vivadent, Liechtenstein), was fabricated for mandibular canine. After cementation of final crowns, lower arch impression was made with irreversible hydrocolloid to obtain primary cast. Custom

acrylic resin trays (DPI RR cold cure, DPI, India) were fabricated using full spacer for maxillary and partial spacer for mandibular arch. Border molding was done with low fusing compound (DPI pinnacle tracing sticks, DPI, India). Dual impressions were made using DPI impression paste (DPI, India) for upper arch and light body (Imprint, 3M ESPE, Germany) for lower arch as a wash material (Fig. 3). Impressions were poured with type IV die stone (Kalrock, Kalabhai, India) to

obtain master cast (Fig. 4). The lower cast was duplicated in agar and wax up was done to obtain metal framework of Co-Cr alloy (Argeloy NP, Argen Corporation, California). Framework was tried in the mouth and wax rims (Y-Dents, MDM Corporation, Delhi) were made to record maxillomandibular relationship. The centric relation position of the patient was recorded and it was mounted on free plane articulator. Teeth arrangement was done to obtain a balance of mastication, esthetic and phonetics within physiologic limits. Try-in was carried out and acceptance of patient and his relatives was taken. The dentures were cured using heat cure acrylic resin (DPI-heat cure, DPI, India) and removable partial dentures were finished and polished (Fig. 5).

During insertion of the removable partial denture, it was checked for border extension, proper adaptation and balanced occlusion, as it provides stability of partial denture during various movements (Fig. 6). Patient was recalled after regular intervals to correct any problem associated with wearing of dentures.^{6,7}

DISCUSSION

The success of any therapy depends upon the nature of surgical defect, patient cooperation, type of treatment given and many other factors. A cast partial guidance prosthesis, palatal ramp, palatal inclined plane may be suggested for patients having mandibular deviation after resection of mandible.⁸

In this clinical case, there was no acceptable mandibular deviation after segmental hemimandibulectomy. So a cast partial denture was advised for maxillary and mandibular arch. But due to financial reasons, only mandibular cast partial denture and acrylic RPD in maxillary arch were planned because acrylic RPD can achieve retention and stability in maxillary arch as it has a broad surface area but in resected mandible cast partial or implant is the only option.

In maxillary arch, a full spacer was advised as mucosa was friable due to radiation therapy. Final impression was made with DPI impression paste and pickup impression with irreversible hydrocolloid material by using modified plastic

stock trays, as the patient had limited mouth opening due to wound contracture.

In mandibular arch, a sectional tray with partial spacer was designed and final impression was made with light body material so as to record all the fine details for better adaptation of framework.

SUMMARY AND CONCLUSION

The philosophic approach to the treatment and rehabilitation of patients with resected mandibles is not in concentrating on what has been sacrificed in the eradication of the disease but rather in taking full advantage of remaining structures. This clinical report describes the fabrication of cast partial in lower arch and acrylic RPD in upper arch for patient following segmental mandibulectomy. The patient was able to achieve a functional intercuspal position after insertion of prosthesis and mastication was possible after a short period of accommodation.

REFERENCES

1. Schneider R, Taylor TD. Mandibular resection guidance prostheses: A literature review. *J Prosthet Dent* 1986;55:84-86.
2. Marunick M, Mahmassani O, Siddoway J, Klein B. Prospective analysis of masticatory function following lateral mandibulectomy. *J Surg Oncol* 1991;47:92-97.
3. Fattore L, Marchmont Robinsoon H, Crinzi RA, Edmonds DC. Use of a two piece gunning splint as a mandibular guide appliance for a patient treated for ameloblastoma. *Oral Surg Oral Med Oral Pathol* 1988;66:662-65.
4. McCasland JP. Cancer of the head and neck—Proceedings of an international symposium, Mortreux, Switzerland. New York April 2 to 4 American Elsevier Publishing Co. Inc. 1978;316.
5. Brown KE. Complete denture treatments in patients were resected mandibles. *J Prosthet Dent* 1969;21:443.
6. Zarb GA, Bolender CL, Carlsson GE. In: Boucher's Prosthodontic treatment for edentulous patients (12th ed). Mosby: St Louis 2004;425-26.
7. Sharry JJ. Complete denture prosthodontics (3rd ed). Blakiston: USA 1974;255-56.
8. Beumer J, Curtis TA, Marunick MT. Maxillofacial rehabilitation: Prosthodontic and surgical considerations. Ishiyaku Euro America: St Louis 1996;184-88.