

Beam of Light for Rehabilitation of a Hemi- Mandibulectomy Patient - A Clinical Case Report

¹Poonam Kadain, ²Shefali Goel, ³Rekha Gupta, ⁴Nidhi Puri

^{1,2} Senior Resident, ³Professor and Head, ⁴Associate Professor

MDS, Department of prosthodontics, Maulana Azad institute of dental sciences

***Corresponding Author:**

Poonam Kadain

Shiv Sadan, M-35, first floor, street no-3, new mahavir nagar, new delhi-110018

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

The primary goal of prosthodontic rehabilitation of a hemi-mandibulectomy patient is to minimize or eliminate the mandibular deviation, improve and restore the lost functions and esthetics. So, basic approaches available for these patients are surgical reconstruction of resected part, physiotherapy and prosthodontic intervention. Prosthetic approach include implant supported prosthesis, mandibular guide flange prosthesis, palatal ramp restoration and twin occlusion prosthesis. This case report describes the prosthodontic rehabilitation of a patient who had undergone hemi-mandibulectomy subsequent to the treatment of squamous cell carcinoma. He was first given palatal ramp appliance for retraining of mandibular musculature in order to functionally reposition the residual mandibular segment and then treated with definitive mandibular guide flange prosthesis to restore the function and esthetics.

Keywords: rehabilitation, guide flange, palatal ramp, hemi- mandibulectomy, training device.

INTRODUCTION

Resection of mandible leads to various clinical manifestations such as altered mandibular movements, facial disfigurement, difficulty in swallowing, impaired speech and articulation, and deviation of the mandible towards the resected site. The degree of these physiological and cosmetic complications are dependent on several factors such as the location and extent of osseous and soft tissue resection, the method of surgical site closure, degree of tongue function impaired, the presence and condition of the remaining natural teeth, the degree to which nerve innervations has been involved, and the use of adjunctive procedures such as radiation therapy and the timing of physical therapy and prosthodontic treatment.^{1,2} In the discontinuity defect, mandibular deviation is most common post-surgical problem which occurs due to muscle imbalance, compromised proprioception, scar contracture and tight wound closure.^{3,4,5} Various methods available to achieve optimum maxilla-

mandibular relationship are intermaxillary fixation,⁶ vacuum formed PVC splint,⁷ palatal ramp appliance⁸ or mandibular resection guiding flange,¹⁹ a widened maxillary occlusal table using a double row of teeth.^{10,11} It has been reported that fabrication of provisional training appliance either mandibular resection guidance or palatal ramp help to achieve normal maxillomandibular position before the fabrication of a definitive restoration.¹² Once the patient is able to achieve the proper mediolateral position of the mandible for occlusion of the natural teeth but is unable to repeat this position consistently for mastication, guide-flange prosthesis can be considered.

CASE REPORT

A 47-year-old male patient reported to the Department of Prosthodontics with chief complaint of inability to chew food and disfigured facial appearance following

mandibular resection. Patient had undergone segmental mandibulectomy one year back due to squamous cell carcinoma of left lower alveolus. Patient had facial asymmetry, severe deviation of residual mandible towards the left side and loss of functional occlusion on right side as the patient was unable to achieve normal medio-lateral position of the mandible. The patient had not been provided any inter-maxillary fixation and/or physiotherapy program after surgery.

Clinical procedure

The maxillary and mandibular impressions were made in irreversible hydrocolloid were poured using type 3 dental stone. To construct palatal ramp appliance, modelling wax was adapted to cover the palate as well as the left maxillary teeth. Additional wax was adapted in the inclined plane form on the right side (non- defect side) of the maxilla towards the palatal surface. The inclination of this appliance in wax was determined by gliding movement of the mandibular teeth over the lateral aspect of the ramp. After 8 weeks the patient was able to achieve an acceptable mediolateral position of the mandible for occlusion of the natural teeth but was unable to repeat this position consistently for mastication (figure-1). Hence, mandibular prosthesis with guide flange was planned to replace teeth and associated tissues.

For Definitive Prosthesis

Primary maxillary and mandibular impressions were made with irreversible hydrocolloid (Alginate) and poured in type-3 dental stone. Final mandibular impression, was made using low fusing impression compound and medium body addition silicon impression material (figure 2). After registration of jaw relations, the wax trial dentures were checked in patient's mouth for occlusion, esthetic and comfort. On the right (non-defect) side, round the wire substructure modelling wax was used to prepare guide flange on the buccal side. The finished and highly polished prosthesis was inserted in patient's mouth after verification of extension, occlusion and esthetics. (Figure 3,4).

DISCUSSION

Rehabilitation is an essential phase in the complete and comprehensive treatment plan of oral cancer patients and it should be given immediate consideration at the time of diagnosis. In hemi-

mandibulectomy patients, there is a shift of the remaining mandibular segment towards the resected side and frontal plane rotation in downward and inferior direction. This is due to the uncompensated influence of the contra-lateral musculature, particularly the medial pterygoid muscle.¹ If this influence is left uncompensated; the contraction of the cicatricial tissue on the operated side fixes the residual fragment in its deviated position which leads to facial deformity and functional loss.

The success of rehabilitation depends on, patient co-operation, the extent of surgical defect and anticipated surgical reconstruction and prosthetic management with prior physiotherapy program. The factors of concern before treating this present case were that the patient did not receive any immediate treatments such as inter-maxillary fixation or physiotherapy and reported for rehabilitation after a long period of about one year after surgery which leads to severe mandibular deviation. In spite of these factors of concern, the factors that helped us to achieve the desired outcome were the patient's motivation, remaining tongue, floor of the mouth, and its contiguous soft tissues. Teeth on the non-resected side guide the patient to have better proprioceptive sense which help in obtaining the functional position after the insertion of the prosthesis. A mandibular guide flange is not likely to be successful and may be damaging to remaining teeth and soft tissue if the mandible in its correct position requires the application of force beyond that needed to gently assist the correct positioning. On the other hand, palatal ramp is more adjustable, prevent the supra-eruption of the maxillary teeth present on the defect side, preferred for the patient having severe mandibular deviation or in cases where moderate pressure is required to maintain the mandible in its correct position. That is the reason palatal ramp was selected as a training device in this case report. Since patient has some resistance encountered in positioning the mandible, so guidance ramp of acrylic was considered as this material can be periodically adjusted as an improved relationship is obtained. Acrylic guide flange prosthesis presented has the advantages of being a simple, more adjustable, less chair time and cost effective.

CONCLUSION

Management of a long-standing segmental mandibulectomy case without any prior intervention is a challenging task, especially due to the lack of bony support and loss of muscle co-ordination. Training appliances most commonly used are Mandibular guide flange or palatal ramps which retrain the mandibular musculature to achieve an acceptable occlusal interdigitation. However, in a long-standing case, definitive mandibular guidance prosthesis with a guiding flange and acrylic teeth on the resected side helps in restoring the aesthetics and maintaining the mandible in acceptable occlusion and functional position.

REFERENCES

1. Martin JW, Shupe RJ, Jacob RF, King GE. Mandibular positioning prosthesis for the partially resected mandibulectomy patient. *J Prosthet Dent* 1985; 53:678-680.
2. Schneider R, Taylor TD. Mandibular resection guidance prostheses: A literature review. *J Prosthet Dent* 1986; 55:84-86.
3. Desjardins RP. Occlusal considerations for the partial mandibulectomy patient. *J Prosthet Dent* 1979; 41:308-315.
4. Beumer J 3rd, Curtis TA, Marunick MT. Maxillofacial Rehabilitation: Prosthodontic and Surgical Consideration. St. Louis: Ishiyaku Euro America; 1996. p. 113-224.
5. Beumer J, Marunick MT, Esposito SJ. Maxillofacial Rehabilitation. 3rd ed. USA. Quintessence; 2011. p. 87-9, 118-20.
6. Aramany MA, Myers EN. Intermaxillary fixation following mandibular resection. *J Prosthet Dent* 1977; 37:437-44.
7. Monaghan AM, Bear AS. A simple appliance to correct mandibular deviation following hemimandibulectomy. *Br J Oral Maxillofac Surg* 1990; 28:419-20.
8. Swoope CC. Prosthetic management of resected edentulous mandibles. *J Prosthet Dent* 1969; 21:197-202.
9. Mathew A, Thomas S. Management of a hemi mandibulectomy defect with a definitive guiding flange prosthesis. *Pushpagiri Med J* 2012; 3:132-34.
10. Prakash V. Prosthetic rehabilitation of edentulous mandibulectomy patient: A clinical report. *Indian J Dent Res* 2008; 19:257-60.
11. Rosenthal LE. The edentulous patient with jaw defects. *Dent Clin North Am* 1994; 8:773-9.
12. Robinson JE, Rubright WC. Use of a guide plane for maintaining the residual fragment in partial or hemi mandibulectomy. *J Prosthet Dent* 1964; 14:992-9.
13. Moore DJ, Mitchell DL. Rehabilitating edentulous hemimandibulectomy patients. *J Prosthet Dent* 1976; 35:202-6.

IMAGES



Figure-1 palatal ramp appliance



(Figure-2) shows mandibular deviation corrected with palatal ramp appliance



Figure 3- shows final impressions and final mandibular guide flange prosthesis





Figure 4- showing intra oral view with guide flange prosthesis