GUIDING FLANGE PROSTHESIS FOR A PATIENT WITH AHEMI-MANDIBULECTOMY DEFECT: A CLINICAL REPORT
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ABSTRACT
Rehabilitation of patients with maxillofacial defects is a difficult task. The denture fabrication for such a patient becomes extremely difficult due to the unavailability of attached keratinized supporting tissues. Pre-prosthetic plastic reconstructive surgery with or without implant therapy may improve denture retention and stability. But this treatment option sometimes cannot be accomplished because of the complexity of surgical reconstruction and the patient’s unwillingness to undergo further surgical interventions. Prosthetic rehabilitation alone, without plastic-surgical reconstruction for an edentulous patient who has undergone segmental mandibulectomy, is a challenging task. This article describes the fabrication and function of a maxillary palatally positioned, functionally moulded guide flange to assist post resection physiotherapy and rehabilitation.

KEYWORDS: Hemimandibulectomy, Guide flange, post resection physiotherapy, rehabilitation.

INTRODUCTION
Malignant tumors of oral cavity can cause more destruction to innumerable adjacent tissues as compared to any other parts of the body. The surgical management for neoplastic lesions of the oral cavity often requires resection involving several anatomical structures such as mandible, floor of the mouth, tongue, and palate etc. In hemimandibulectomy cases mandibular deviation occurs due to loss of continuity of mandible, the related altered muscle function will clinically result in facial asymmetry causing significant aesthetic deformities, functional compromise and psychological sequel.

The residual mandible deviates medially and inferiorly, the amount of deviation will be more or less evident depending on the location and extent of their section, the remaining amount of soft tissue, nerve innervations involvement and the presence of remaining natural teeth. When mandibular continuity is lost in segmental mandibulectomy, masticatory function is compromised because of muscular imbalance that results from unilateral muscles removed, loss of grinding table due to teeth lost, altered maxilomandibular relation, and decreased teeth to teeth contact which results in significant decrease in occlusal force. The rehabilitation objective in mandibulectomy cases is to re-educate mandibular muscles to re-establish an acceptable occlusal relationship for residual hemimandible, so that patient could control opening and closing mandibular movements and minimize the scar formation that will make deviation more sever and less favourable for the prosthetic intervention.

Early corrective Mandibular moment therapy like stretching exercises consisting of patient grasping the chin and moving the mandible away from surgical side. It can be started two weeks post surgically and carried upto 6-8weeks during post operative healing period, and then definitive prosthetic rehabilitation can be taken up. A review of the literature shows varying basic design of prosthesis used, that can be mandibular-based or palatally-basedanchored on natural teeth or denture flange.

The mandibular guide flange device for hemimandibulectomy patients presenting good natural teeth on the residual mandible fits generally over thateeth (base-plaque) and has a guide plane (flange splint) extending into the maxillary buccal vestibule, and which rides on the buccal surfaces of several of the maxillary teeth: this is the mechanical system preventing the mandible from turning toward the resected side. Normally, patients can use a guide flange device all the day except while eating. The purpose of this article is to describe a new therapeutic possibility for the prosthetic management of hemimandibulectomy patients that foresee using only one device for both corrective mandibular movement therapy and masticatory function. This sort of device permits to use the same prosthesis both for eating and for mechanical correction of mandibular deviation.

CASE REPORT
A 59-year-old male patient came for Dental Prosthesis Service to a private dental clinic, complaining of inability to grind, dryness of the mouth and disfigured facial appearance as outcome of right mandibular hemimandibulectomy. Patient had history of squamous cell carcinoma of rightramus of the mandible, which was treated by surgical hemimandibulectomy followed by radiotherapy and chemotherapy. No intermaxillary
fixation was applied at surgical time. Extra oral examination revealed deviation of residual mandible towards right side and loss of functional occlusion on left side. Intraoral examination reveals missing (FDI notation followed) 16, 17, 31, 41, 42, 43, 44, 45, 46, 47, 48. (Figure 1 & 2). Primary maxillary and mandibular impressions were made with alginate (Tropicalgin) which was later poured with dental stone (Kalstone, India) (Figure 3 & 4).

**Figure 1**

Figure 2. Medial deviation of mandibular teeth Extra oral view without prosthesis

**Figure 3** : Primary impression of maxillary arch

**Figure 4** : Primary impression of mandibular arch

The maxillary cast was mounted on a semi adjustable articulator using a face bow. The mandibular cast was mounted with an interocclusal record that was made of bite registration wax (Sai Dental corporation, India). After mounting of the mandibular cast it was observed that the buccal surface of the mandibular teeth were almost 6 mm lingual to the palatal surface of the maxillary palatal cusps, that shows the amount of mandibular deviation is due to hemimandibulectomy. Because of so much deviation, the remaining mandibular teeth were not coming in proper occlusion with maxillary teeth. So teeth arrangement was carried out in such a manner that remaining mandibular teeth can come in occlusion with artificial maxillary teeth and trial procedure was completed. During try in appointment, there was decent deviation of mandible towards midline.

**Figure 5. Fabricated prosthesis**

**Figure 6. Prosthesis in function**

The whole pattern was invested, dewaxing done and heat cure acrylic was packed and processed. The patient was recalled and the prosthesis was inserted and checked for retention and stability. After the prosthesis was inserted, the mandible started to close towards midline. (Fig 6 and Fig 7). The patient was given instruction regarding the maintenance of the prosthesis and was put on a regular follow up.

**DISCUSSION**

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. Mandibular deviation occurs primarily because of the loss of the tissue responsible for the movements. Loss of continuity also results in vertical rotation of the residual mandibular fragment in inferior direction. Rotations caused by the pull of the suprahypoid musculature on the residual mandibular fragment causing inferior displacement and rotation around the fulcrum of the remaining condyle. Gravity, loss of anchorage, loss of temporomandibular ligaments allows the mandible to fall vertically away from the normal position.

The final outcome of the surgery is facial disfigurement, loss of occlusal contact, loss of lip contact. The associated problems are, decreased mouth opening difficulty in
mastication, functional limitation of the tongue such as speech impairment, food bolus control, loss of taste sensation and lack of adaptability to prosthesis. The guide ramp serves as prosthesis to minimize radiation scarring of the healed tissues. Stretching of the tissues during healing minimizes the amount of scarring within the area. With scars there is a tendency to contract which in turn pulls the remaining mandible more and more towards the defect side. It is important that the angulation of the guide ramp be increased with time, this allows the mandible to come to a more favourable position.

The basic design of the guide flange prostheses will depend greatly on post-operative findings, as there are no type of appliances that will serve for every patient. However there are fundamental principles for the construction of a functional appliance. Every patient should maintain functional occlusion for mastication, and this may be accomplished by a guide plane. No articulator can reproduce the hemimandibular movements, therefore functional occlusal relation should be recorded and this relation might change at a later date, if mandibular control ability improves or differs. Using only one guide flange prosthetic device as that proposed in this work permits to re-educate mandibular muscles and use the same to eat.

In this way patients are not obliged to use one device for the physiotherapy step and a second device to eat. The prosthetic device proposed was:

a) Functional, as desirable occlusion can be re-established.

b) Esthetic, as Mandibular deviation can be corrected.

c) Comfortable to wear, as cross arch support was derived.

d) Easy to make, repair and better hygiene maintenance

CONCLUSION

In patients with mandibular resection the prosthetic prognosis of any prosthesis is quite variable. However improved mastication on the non-resected side with an movable prosthesis is a reasonable objective. Patient was satisfied with the way the mandible could occlude after wearing the prosthesis. For better results, the prosthetic management should be combined with manual exercise program.

REFERENCES


