

## Guided flange prosthesis; A non-surgical aid for hemi mandibulectomy patient: A case report.

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### ABSTRACT

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Loss of the continuity of the mandible destroys the balance and the symmetry of mandibular function, leading to altered mandibular movements. Due to undergoing surgery or trauma results in mandibular deviation towards the defect side resulting in loss of occlusion on the unresected side. This imparts greater effect on patients over all functioning, nutrition, mastication and speech. This case report describes prosthodontic management of a patient who has undergone hemi-mandibulectomy; provided mandibular guide flange prosthesis. The prosthesis helps patient moving the mandible normally, without deviation during functions like speech and mastication.

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### INTRODUCTION

Mandible is the most common site for intraoral tumors as compared to maxilla, which often requires the resection of large portions of the mandible. Disabilities resulting from such resections include impaired speech, difficulty in swallowing and deviation of mandible during functional movements and severe cosmetic disfigurement. Surgical reconstruction of mandibular discontinuity defects involves placing autogenous graft, allogeneic graft, xenograft, or alloplastic implants such as titanium, vitallium, stainless steel, silicone, and plastics.<sup>1</sup> Discontinuity of the mandible after surgical resection or trauma destroys the balance and symmetry of mandibular function, which leads to altered mandibular movements and deviation of the residual segment towards the defect side, resulting in loss of occlusion on the unresected side.<sup>2</sup> This mandibular deviation is mainly due to uncompensated influence of contralateral musculature particularly the internal pterygoid muscle and pull from the contraction of cicatricial tissue on the resected side.<sup>3,4</sup> Prosthetic rehabilitation of mandibular discontinuity defects aims in restoration of mastication within the unique movement capabilities of the residual function in the mandible. However for some patients who do not desire reconstruction, or who are medically compromised, mandibular guidance therapy can be instituted to retrain the patient's neuromuscular system to achieve an acceptable occlusion of the remaining natural teeth.<sup>2</sup>

Guide flange prosthesis (GFP) is a mandibular conventional prosthesis designed for the patient who is able to achieve an appropriate mediolateral position of the mandible but is unable to repeat this position consistently for adequate

mastication. The following case report presents one such case of hemimandibulectomy which has been rehabilitated using a mandibular Guiding Flange Prosthesis.

### CASE REPORT

A 45 year old male patient was referred to the department of prosthodontics with the chief complaint of difficulty in mastication due to deviation of the mandible towards the defective side, thus causing disocclusion of the teeth on the normal side. Patient also complained of difficulty in speech. A detailed case history revealed that the patient was operated due to squamous cell carcinoma of the right side of mandible 2 months back and had undergone radiation therapy postoperatively for a period of time after the hemimandibulectomy procedure. Extraoral examination shows facial asymmetry due to depression on right side and deviation of the mandible towards the right. (Fig. 1).



**FIG 1:PRE OPERATIVE**

Intraoral examination showed thick, freely movable soft tissues with scar formation, loss of alveolar ridge and obliteration of buccal and

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lingual sulci in the left half of mandibular region. The right maxillary anterior teeth and maxillary posterior teeth were attrited. Patient was unable to guide the residual mandible to occlude with the remaining maxillary dentition even on application of external force. On the basis of clinical and radiographic examination the patient was classified as Class III Mandibular defect according to Cantor and Curtis classification of mandibular defects. Based on the clinical situation, a transitional guiding prosthesis was planned along with maxillary removable prosthesis, followed by cast metal prosthesis. Two sets of the maxillary and mandibular preliminary impressions were recorded using stainless steel stock trays with irreversible hydrocolloid impression material. The impressions were poured with Type III gypsum material and casts were retrieved. A 21 gauge orthodontic wire was adapted on to the lower cast with u shaped loop extending to maxillary arch, (Fig. 2). The maxillomandibular relations were recorded using wax bite to measure the deviation of the mandible accurately.



**FIG 2: WIRE FRAMEWORK**

The maxillomandibular relations were transferred on to the articulator. Another set of casts were mounted on articulator with maximum intercuspation between the Maxillary and Mandibular teeth. The labial flange was waxed-up with modeling wax around the wire substructure and subsequently, with teeth setting and try in followed by acrylization with clear heat-polymerized acrylic resin to make the Guiding Flange Prosthesis. (Fig. 3). The prosthesis was adjusted in patient mouth and finished and polished (Fig. 4). Post-insertion instructions were given. The patient was followed up at the regular interval, for next one year and the prognosis were good. (Fig. 5)



**FIG 3: WAX TRY IN**



**FIG 4: FINAL PROSTHESIS**



**FIG 5: FOLLOW -UP**

#### **DISCUSSION**

This clinical report illustrates the prosthetic management of a patient who underwent mandibular resection due to squamous cell carcinoma. Loss of mandibular continuity causes deviation of remaining mandibular segment(s) towards the defect and rotation of the mandibular occlusal plane inferiorly. Mandibular deviation toward the defect side occurs primarily because

of the loss of tissue involved in the surgical resection.<sup>5</sup> Successful rehabilitation of edentulous mandibulectomy patients is more difficult than that of a dentulous patient. Sharry<sup>6</sup> described the difficulties encountered as:

- i. Limited coverage and retention
- ii. Grossly impaired relation of the mandible to the maxilla
- iii. Limited movement of the mandible
- iv. Loss of facial structures, sensory and motor.

This prosthesis helpful in reducing the unavoidable sequelae resulting from extensive mandibular resection like muscular contraction, mutilation of occlusal plane etc.

With most mandibulectomy patients the primary determinant usually is related to occlusion. In these patients definitive partial denture restoration are deferred until acceptable maxillomandibular relationship are obtained or an end point in mandibular guidance therapy has reached. Guidance prosthesis serves as a training appliance till a cast partial denture can be fabricated for the patient.

Within 3 weeks, the mandible is guided to the correct occlusal position.<sup>7</sup> This prosthesis helped the patient to get accustomed to close the mandible into the correct intercuspal position without the use of any external aid. The literature shows various types of cast metal guidance prostheses which are effective in managing the mandibular deviation. The guiding flange prosthesis can be regarded as a training prosthesis. If the patient can successfully repeat the mediolateral position, the use of the prosthesis can often be discontinued.<sup>8</sup>

The main purpose is to re-educate the mandibular muscles to re-establish an acceptable occlusal relationship for the residual hemimandible, so that the patient can control the opening and closing of the mandibular movements adequately and repeatedly.<sup>9</sup> However, a removable prosthesis is an equally effective alternative for most patients with mandibular defects, considering the poor prognosis, difficulty in decision making for use of implant and economic feasibility and The presence of teeth in both the arches is important for effective guidance and reprogramming of mandibular movements.<sup>10</sup>

## CONCLUSION

Mandibular guidance therapy, can be a useful adjunct to preserve the mandibular function after partial mandibulectomy procedures and to minimize complications associated like mastication, speech and swallowing. Application of conventional prosthodontic principles, along with patient cooperation, can achieve long term success of the prostheses and predictable patient satisfaction in such cases.

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