GUIDING APPLIANCE FABRICATION FOR A PATIENT WITH LEFT SEGMENTAL MANDIBULECTOMY– A CASE REPORT


Abstract:
Loss of continuity of the mandible leads to deviation of the residual segment towards the surgical site and alteration in muscle function. This results in facial asymmetry and malocclusion. A corrective device known as 'guide flange prosthesis' is indicated to limit this clinical manifestation. Guide flange prosthesis serves as a training device. It can successfully guide the patient to close the mandible into the correct intercuspal position. This clinical report reveals the rehabilitation of patient who underwent hemisection of the mandible, subsequent to treatment for an ameloblastoma. He was successfully rehabilitated with mandibular guide flange prosthesis.

Key Words: Mandibular deviation, Mandibular guide flange prosthesis.

INTRODUCTION

In this modern era, one of the most challenging and demanding maxillofacial endeavors is the fabrication of functional complete dentures for the edentulous patient who has undergone a mandibular resection. The extent of mandibular resection and loss of continuity is directly related to the decreased masticatory function. On the contrary, patients with mandibular resections resulting in little soft tissue loss have less mandibular deviation.

Segmental resection of the mandible results in significant physiological and esthetic problems, especially if condylectomy has been performed. The most important difficulty encountered in such patients is mandibular deviation towards the defective side¹. As earlier the mandibular guidance therapy is initiated in the course of treatment, the more successful the patient's definitive occlusal relationship and masticatory efficiency. Any delays in the initiation of mandibular guidance appliance therapy, due to problems such as extensive tissue loss, radiation therapy, radical neck dissection, flap necrosis and other post surgical morbidities, may result in an inability to achieve normal maxillomandibular relationships.⁵,⁶ Intermaxillary fixation, mandibular-based guidance restorations, and palatal based guidance restorations will reduce or minimize this mandibular deviation.

A well-organized mandibular exercise program should always accompany these methods. Any uncoordinated masticatory movements may result in dental or soft tissue trauma, including severe lip or tongue lacerations and hemorrhage⁴. So, monitoring the lesion, smoothening sharp teeth, using oral appliances, extracting problematic teeth or inhibiting behaviors such as self-mutilation of lips, cheeks and tongue are the best solutions for such soft tissue trauma. This article describes the fabrication of palatal ramp type guidance appliance with supporting flanges for a patient following a segmental mandibulectomy.

CASE REPORT

A 61 year old male patient with hemimandibulectomy done on his right side of the face reported to Department of Prosthodontics (Modern Dental College and

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Research Centre, Gandhinagar, Indore. M.P.) for prosthodontic rehabilitation of the deviated mandible. Patient’s chief complaint was 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 and swelling. A detailed case history revealed that the patient was operated due to squamous cell carcinoma of the right side of mandible 1 year back and had undergone radiation therapy postoperatively for a period of a year after that extraoral examination shows facial asymmetry due to depression on right side and deviation of the mandible towards the right. (Figure 1).

![Figure 1: Extraoral view of patient showing marked mandibular deviation towards right side.](image)

The patient was able to achieve an appropriate mediolateral position of the mandible but was unable to repeat this position consistently for adequate mastication. On the basis of clinical examination the patient was classified as Class II (severely compromised) according to Prosthodontic Diagnostic Index Resources for partial edentulous patients as described by McGarry et al and as class III (Lateral resection of the mandible with distal to the cuspid) according to classification of surgical impairment (cantor and curtis).

A stainless steel stock edentulous tray (modified by trimming buccal flange of right half) and irreversible hydrocolloid (Dentalgin; Prime dental products, Mumbai, India) were used to record preliminary impression of the mandibular arch. Maxillary impression was also made with irreversible hydrocolloid. (Figure 2)

![Figure 2: Impressions in irreversible hydrocolloid](image)

The impressions were poured with Type III gypsum material (Kalstone; Kalabhai Karson, Mumbai, India) and casts were retrieved.

![Figure 3: Casts poured in type III dentalstone.](image)

A 21 gauge hard, round, stainless steel orthodontic wire (KC Smith and Co, Monmouth, UK) was manipulated (Figs. 4) to fabricate a substructure for the modified GFP.

![Figure 4: Wire substructure: occlusal view.](image)

The vestibular (buccal and lingual) flanges and the mandibular guide-flange were waxed-up with modeling wax (Modeling wax; Deepti Dental Products, Ratnagiri, India) around the wire substructure by keeping a maxillary cast in occlusion and subsequently acrylized into the clear heat-polymerized acrylic resin (DPI Heat cure clear; Dental products of India, Mumbai, India) to make the GFP (Fig. 5).
The GFP was tried in patient’s mouth and the initial stability and retention was checked. The inclination of the guide-flange was adjusted by selectively trimming the teeth-contacting surface or adding the auto-polymerizing clear acrylic resin (DPI Cold cure clear; Dental products of India, Mumbai, India). Thus the smooth gliding flange surface was developed intraorally to guide the mandible in a definite closing point (rather than the area) in occlusion. Care should be taken to preserve the buccal-surface indentations of the opposing maxillary teeth which were guiding the mandible in a final definite closing point during mastication. The flange height was adjusted in such a way that it guided the mandible from large opening position (in practical limits of the height of the buccal vestibule) to the maximum intercuspation in a smooth and unhindered path. The prosthesis was delivered and post-insertion instructions were given (figure 6.).

The patient was followed up at the regular interval of two months for next one year.

![Figure 5](image-url)
Figure 5: Completed Modified Guide flange prosthesis

The patient’s last recall visit was after one and half year of the reconstruction. The patient was pleased with the overall performance of the prosthesis and successfully speaks and masticates without clinically significant deviation.

**Discussion**

Depending upon the location and extent of the tumor in the mandible, various surgical treatment modalities like marginal, segmental, hemi, subtotal, or total mandibulectomy can be performed. 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. As we see in this first type of prosthesis, a vertical extension from the buccal aspect of a mandibular prosthesis extends to contact the buccal surface of the opposing maxillary teeth. This extension maintains the mandible in the proper mediolateral position for vertical chewing, but little, if any, lateral movement is possible. Recent advancements in facial reconstructive surgery and osseointegrated dental implants provide a treatment modality that may adequately rehabilitate oral cancer patients so that they can return to a healthy, productive life. Though osseointegrated dental implants is the final solution for replacing the missing teeth for reconstructed mandibulectomy patients, the clinicians must wait for extensive period of time (more than a year) for completion of healing and acceptance of the osseous graft. Our principal aim was to maintain the esthetics during mandibular movements. Hence the GFP was fabricated in clear acrylic resin and the retentive wire components were kept distal to the mandibular canine to minimize the prosthesis display. Support for the GFP is no different from that of any other removable prosthesis, the natural teeth and the residual alveolar ridge being the primary sources. Multiple retentive clasps in widely distributed areas of the arch would be the best approach, but actual placement would be determined by the position of the teeth. Retentive elements...
should be no more rigid than necessary, but they require a more rigidity with a decreasing number of teeth. In the presented case retentive components were modified and incorporated into the prosthesis as a wire substructure. The buccal and lingual vestibular flanges can be brought closer by bending the occlusal cross-over wire components with a universal orthodontic plier to improve the retention. The GFP can be regarded as a training type of prosthesis. If the patient can successfully repeat the mediolateral position, the GFP can often be discontinued. Some patient, however, may continue indefinitely with a guide flange, and the stress generated to the remaining teeth must then be carefully monitored.

CONCLUSION
A comfortable mandibular alignment is not always maintainable in the restoration of the patients with partially resected mandible. The guiding appliances can be a useful adjunct to preserve the mandibular function after partial mandibulectomy procedure to minimize associated complications like mastication, speech, and swelling as “Every human has the Devine right to look human”.

REFERENCES

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