



GUIDE FLANGE PROSTHESIS FOR MANAGEMENT OF A HEMIMANDIBULECTOMY PATIENT- A CLINICAL CASE REPORT

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Article Info	ABSTRACT
<p>Received 15/08/2015 Revised 27/08/2015 Accepted 10/09/2015</p> <p>Key words: Squamous cell carcinoma, Mandibular prosthesis, Maxillofacial prosthesis, Segmental mandibulectomy, Guiding Flange Prosthesis (GFP).</p>	<p>Prosthetic management of surgical defects has always been a big challenge for a Prosthodontist. The sudden change in patient's perspective towards life affects the future outcome of any prosthetic rehabilitation. Surgical resection of the mandible due to presence of benign or malignant tumor is the most common cause of the mandibular deviation. 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. The clinicians must wait for extensive period of time for completion of healing and acceptance of the osseous graft before considering the definitive prosthesis. During this initial healing period prosthodontic intervention is required for preventing the mandibular deviation. This case report describes early prosthodontic management of a patient who has undergone a reconstructed hemi-mandibulectomy with mandibular guide flange prosthesis. The prosthesis helps patient moving the mandible normally without deviation during functions like speech and mastication.</p>

INTRODUCTION

Any kind of damage to mandible has the potential to disrupt any of these functions. Common causes of mandibular defects are tumor resections and, to a lesser degree, trauma and osteoradionecrosis. Mandibular resection is surgical removal of a portion or all of the mandible and the related soft tissues also called mandibulectomy (GPT 2008). Patient who had undergone segmental resection of mandible with condylectomy results in significant physiological and esthetic problems [1]. Any delays in the initiation of mandibular guidance appliance therapy may result in an inability to achieve normal maxilla mandibular relationships due to problems such as extensivetissue loss, radiation therapy, radical neck dissection, flap necrosis and other post-surgical morbidities

[2]. There are different treatment modality to reduce deviation or eliminates the deviation that includes removable mandibular guide flange palatal ramp, intermaxillary fixation, implant-supported prosthesis and palatal guidance restorations. These treatment modalities are useful in reducing mandibular deviation and improving masticatory performance and efficiency. The prosthodontic treatment modalities have made it possible to rehabilitate and manage patients with hemimandibulectomy defect. 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 [3]. This case report describes



prosthodontic management of a patient who has undergone a hemimandibulectomy. (Left side of mandible). A GFP was fabricated to treat the patient.

CASE REPORT

A 58 year old male patient with hemimandibulectomy done on his left side of the face reported to our clinic 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 left side of mandible 4 years back and had undergone radiation therapy postoperatively for a period of a year after that. Intraoral views of mandible and maxilla showed. (Figure 1 and 2). Extraoral examination shows facial asymmetry due to depression on left side and deviation of the mandible towards the left side. (Figure 3). The patient was able to achieve an appropriate mediolateral position of the mandible but was unable to repeat this position consistently for adequate mastication.

A stainless steel stock edentulous tray (modified by trimming buccal flange of left 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. The impressions were poured with Type III gypsum material (Kalstone; Kalabhai Karson, Mumbai, India) and casts were retrieved. A 19 gauge hard, round, stainless steel orthodontic wire (KC

Smith and Co, Monmouth, UK) was manipulated to fabricate a substructure for the modified GFP. 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 pink color heat-polymerized acrylic resin (DPI Heat cure ,Dental products of India, Mumbai, India) to make the GFP. (Figure 4). The GFP was tried in patient’s mouth and the initial stability and retention was checked. (Figure 5) The inclination of the guide-flange was adjusted by selectively trimming the teeth-contacting surface or adding the auto-polymerizing pink acrylic resin (DPI Cold cure, 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. (Figure 6). 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. Post operative profile view of the patient was improved with the GFP. (Figure 7). The prosthesis was delivered and post-insertion instructions were given. The patient was followed up at the regular interval of two months for next one year. The patient was pleased with the overall performance of the prosthesis and successfully speaks and masticates without clinically significant deviation.

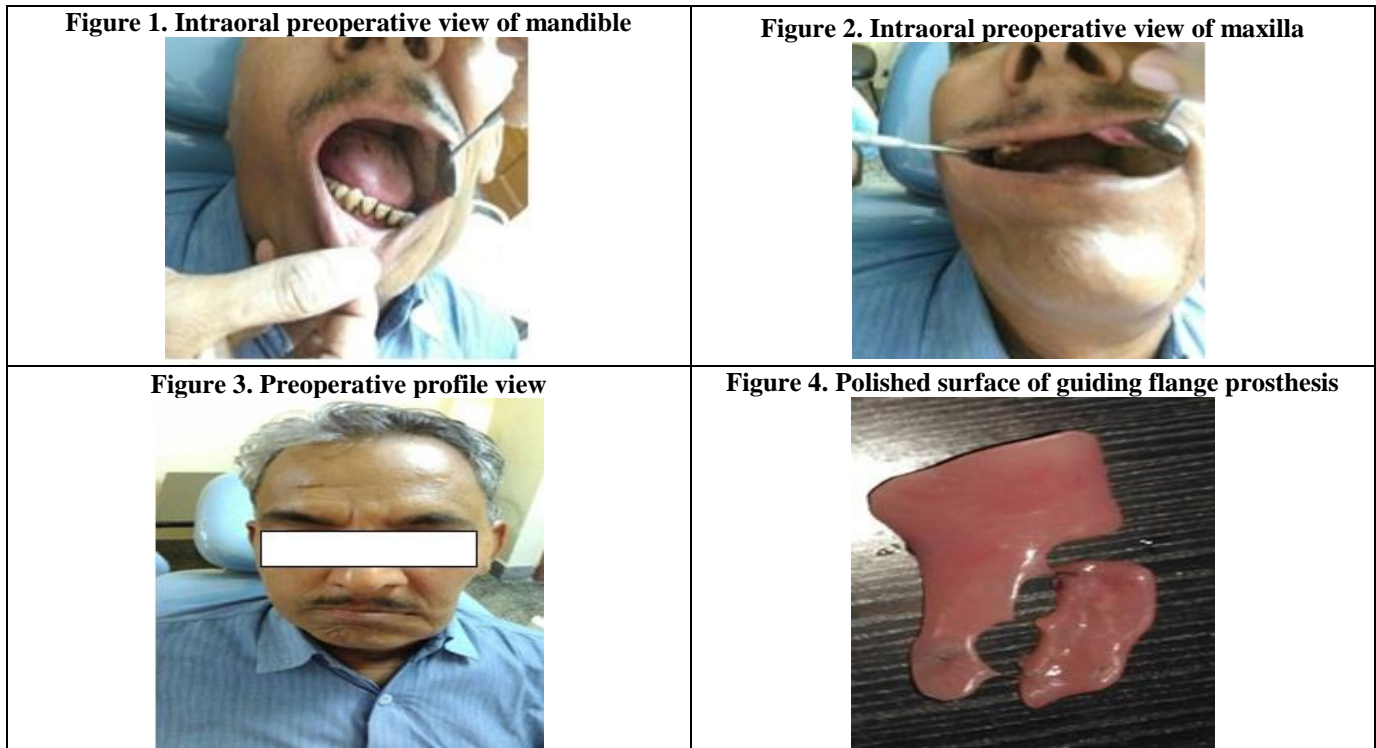


Figure 5. Prosthesis in place



Figure 6. Prosthesis in place during definite closing point



Figure 7. Post operative profile view



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 [4]. 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 [5]. Our principal aim was to maintain the esthetics during mandibular movements. Hence the GFP was fabricated in pink 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 [6]. 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.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.



STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964

Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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