

Decision making in the fabrication of mandibular guide flange prosthesis:

A case series.

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Abstract

Introduction: Post-cancer ablative surgery often results in a gross imbalance in the anatomic structure, thereby impairing occlusion and other vital functions of life. The remaining mandible after surgery shifts to the medial and superior direction, causing impaired functions. "Guide flange prosthesis" is an appliance, which is indicated in such a situation to reduce the clinical appearance.

Case Presentation: This paper describes a case series of 3 cases, where patients with different clinical presentations were treated with different mandibular guide flange prosthesis design.

Discussion: The degree of mandibular movement impairment depends on factors like the location and extent of the defect, amount of soft tissue defect, the neural tissues involved, and the presence of natural teeth. The mandibular guide flange prosthesis acts as interference in patient habitual movement post-surgery and redirects the mandible to acceptable occlusion. Hence suitable design of mandibular guide flange prosthesis must be selected for optimum outcome.

Keywords: Hemi-mandibulectomy, Mandibular guide flange prosthesis, Mandibular guidance therapy rehabilitation.

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Introduction

The synchronous function of masticatory muscles, along with both temporomandibular joints and other anatomic structures, results in optimum mandibular movements, which are important to maintain occlusion and other vital functions of life. However, post-cancer ablative surgery often results in a gross imbalance in the anatomic structure, thereby impairing the above-mentioned functions. Such problems as facial asymmetry and malocclusion lead to decreased quality of life for the patients.^[1-3]

The remaining mandible after surgery shifts to the medial and superior direction, causing impaired functions. The degree of impairment depends on factors like the location and extent of the defect, amount of soft tissue defect, the neural tissues involved,

and the presence of natural teeth.^[2] "Guide flange prosthesis" is an appliance, which is indicated in such a situation to reduce the clinical appearance. The purpose of this appliance is to train the mandibular muscles and to regain the acceptable occlusal relationship. Also depending on the final condition of the dentition and ability of the patient to manipulate the mandible back into centric relation, various types of mandibular guide flange prostheses can be selected for a better outcome.^[4-6]

Case-Series:

Case No. 1:

A 60-year-old male patient reported difficulty chewing. The patient was diagnosed with moderately differentiated squamous cell carcinoma and treated with

hemi-mandibulectomy of the right side of the mandible up to the midline, 8 months ago (Fig 1). Patient had adequate mouth opening for fabrication of prosthesis, and deviation of the mandible was 7mm. Patient was able to manipulate the jaw back to the position where at least minimal tooth contact can be established. However, the only few teeth remaining on the left mandible were attrited and found too unstable to withstand the force exerted by the mandibular guidance (Fig. 2). Hence, it was decided to fabricate a Palatal Ramp type of guidance prosthesis for the patient. After a preliminary impression and cast fabrication, a palatal plate was created, and over it, a ramp was designed so that it will guide the mandible in the desired direction. Inside the patient's mouth, the appliance was checked for accuracy of fit, and then sequentially self-curing resin was added on the surface of the ramp, which contacts mandibular teeth (Fig 3). Guidance was checked by final contact of the remaining mandibular teeth with the maxillary teeth (Fig 4). Since the patient also has xerostomia, an artificial salivary substitute was recommended, and the patient was scheduled for further prosthetic treatment once the result of the guidance prosthesis was achieved.

Case No. 2:

A 45-year-old male patient reported difficulty chewing, frequent biting on the tongue, and deviation of the mandible on the left side. The patient was treated with a left hemi-mandibulectomy six months ago due to squamous cell carcinoma of the left mandible. The deviation of the mandible was 10mm on the left side. It was decided that the guiding flange component would be constructed buccal to the remaining dentition so that the tongue space was not further constricted. Primary impressions and a cast were fabricated and articulated in the desired occlusion (Fig 5). On the mandibular cast

wire components were adapted for creation of retentive element and buccal flange with an angulation, that can contact maxillary teeth and guide the mandible to optimum occlusion (Fig 6). It was then acrylized and delivered to the patient after checking the final guidance provided by the buccal flange (Fig. 7).

Case No. 3:

A 51-year-old male patient reported difficulty chewing and deviation of the mandible to the right side. The patient was treated with hemi-mandibulectomy two years ago. On examination, it was found that the mandible was deviated to the right by 18mm and the patient was unable to move the mandible towards optimum occlusion (Fig. 8). The guidance force expected from the prosthesis was anticipated to be detrimental to the remaining dentition. Hence, it was decided to fabricate palatal occlusal plane prosthesis for the patient. The primary impression and casting fabrication were done. Jaw relation at the habitual mandibular position of the patient was recorded by the occlusal rim. Teeth were set palatal to the maxillary dentition so that it meets the mandibular dentition (Fig 9). After trial, it was acrylized, and the final prosthesis was delivered to the patient with occlusion from the palatal to the remaining maxillary teeth (Fig.10).

Discussion:

Surgical resection of oncologic tissue often leads to a situation where remaining mandible becomes retracted and shifts to the surgical side during closure. Disproportionate bilateral muscle attachment causes rotation of the mandible during closure as a result of elevator muscle force imbalance.^[7-8] Thus, the mandibular guide flange prosthesis acts as an interference in patient habitual movement post-surgery and redirects the mandible to optimum occlusion.

However, the choice of guidance prosthesis is determined by factors like the health of the remaining teeth, the amount of deviation, the ability of the patient to manipulate the jaw, and the amount of force to be exerted on the anchoring tooth when the mandible is guided. The need for guidance and the duration of wear are also factors in choosing the materials for the prosthesis and scheduling recall appointments.^[1,6] Closely monitoring patient compliance and the outcome of mandibular guidance prosthesis often dictates what type of definitive treatment can be provided to the patient after guidance therapy. The earlier the treatment is started, the better the outcome for mandibular guidance therapy. Hence, close planning with operating surgeons can be done so that guidance can be started within one week post-surgery. These days, implant-supported rehabilitation with free flap grafts is becoming a well-accepted treatment modality. Even then, during the healing period of the primary graft or the implants, mandibular guidance should be maintained so that deviation of the mandible is limited.

Conclusion:

Following mandibular resection, anatomic changes cause disfigurement and malocclusion. Mandibular guidance prostheses are an essential appliance that helps to reduce mandibular deviation and bring acceptable occlusion back into the

patient's mouth, leading to improved quality of life.

References:

1. Beumer J, Curtis T, Firtell D, editors. Maxillofacial rehabilitation. St Louis: Mosby 1979;90-169.
2. Cantor R, Curtis TA. Prosthetic management of edentulous mandibulectomy patients. Part I. Anatomic, physiologic and psychologic consideration. J Prosthet Dent 1971;25:446-457.
3. Schneider RL, Taylor TO. Mandibular resection guidance prosthesis: a literature review. J Prosthet Dent 1986;55:84-86.
4. Cantor R, Curtis TA. Prosthetic management of edentulous mandibulectomy patients: Part II, Clinical procedures. J Prosthet Dent 1971;25:546-555.
5. Martin JW, Shupe RJ, Jacob EF, King GE. Mandibular positioning prosthesis for the partially resected mandibulectomy patient. J Prosthet Dent 1976;35:202.
6. Taylor TD. Diagnostic considerations for prosthodontic rehabilitation of the mandibulectomy patient. Clinical Maxillofacial Prosthetics. Chicago: Quintessence Publishing 2000;3:155-170.
7. Gopi A, Singla NK, Saini DK, Legha VS. Guide the Mandible Back Home: Guide Flange Prosthesis. J Orofac Res 2013;3(4):290-3.
8. Singh PP, Sahni SK, Nair K, Sargaiyan V, Rawat P, Gupta S. Prosthodontic Management of Mandibular Deviation using Guide Flange Prosthesis in Hemimandibulectomy: A Review. I J Pre Clin Dent Res 2015;2(2):45-49.

FIGURES



Fig 1: OPG showing mandibular defect



Fig 2: Remaining few mandibular teeth attrited



Fig 3: Palatal ramp prosthesis in place



Fig 4: Remaining dentition in occlusion



Fig 5: Articulated cast



Fig 6: Adaptation of wire for buccal flange prosthesis



Fig 7: Guidance of mandible provided by the prosthesis



Fig 8: Deviation of mandible

Fig 9: Teeth Arranged Palatally

Fig 10: Final prosthesis