IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 9 Ser. 1 (September. 2025), PP 35-38
www.iosrjournals.org

Guding Flange Prosthesis For Hemi Mandibulectomy Patients: A Case Report

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Abstract:
Introduction: *Loss of mandibular continuity due to surgical resection results in mandibular deviation, impaired mastication, speech difficulties, and esthetic compromise. Guiding flange prostheses are effective in retraining mandibular movements and reestablishing functional occlusion in hemimandibulectomy patients.*
Case Report:
A 41-year-old male, previously treated for squamous cell carcinoma with left hemimandibulectomy, inferior maxillectomy, modified radical neck dissection, and radiotherapy, presented with difficulty in mastication. Clinical examination revealed gross facial asymmetry, mandibular deviation, partial edentulism, reduced mouth opening (11 mm), mucositis, and xerostomia. The defect corresponded to Cantor and Curtis Class III. A guiding flange prosthesis was fabricated using Adams and C-clasps for retention and a buccal flange extension on the unaffected maxillary side. The flange was adjusted intraorally to provide a smooth gliding path for mandibular closure into maximum intercuspation.
Conclusion: *The guiding flange prosthesis effectively minimized mandibular deviation, improved occlusal stability, and enhanced masticatory efficiency. Regular follow-up demonstrated satisfactory functional and adaptive outcomes.*
Keyword: *Hemi-Mandibulectomy, Guiding Flange Prosthesis, Mandibular Deviation, Maximum Intercuspation*.

Date of Submission: 25-08-2025 Date of Acceptance: 05-09-2025

I. Introduction

The mandible is an important structure that along with the muscles of mastication, forms the lower third of the face. Disruption of the mandible, either because of trauma or surgical resection owing to benign, malignant neoplasm, or osteoradionecrosis is common. [2]

The resection of the mandible can be total or segmental with or without loss of continuity, depending on the extension of the lesion. Loss of mandibular continuity causes deviation of the remaining mandibular segment towards the resected side and rotation inferiorly due to muscle pull and scar contracture affecting mandibular movements, mastication, speech and aesthetics. [1]

Surgical resection of the mandible due to presence of benign or malignant tumor is the most common cause of the mandibular deviation.[3]

When mandibular continuity can be restored using bone grafts, metal plates, or a combination of both, most discontinuity-related problems are resolved. However, in patients who either do not opt for reconstruction or are medically compromised, mandibular guidance therapy can be employed. This approach retrains the neuromuscular system to achieve an acceptable maxillomandibular relationship, allowing proper occlusion of the remaining natural teeth. Simple guidance prostheses help restore acceptable occlusal function by retraining the mandible after partial mandibulectomy, enabling a stable functional occlusal relationship to be maintained during the post-operative healing phase.**[4]**

This article describes the fabrication of a guiding flange prosthesis for a hemimandibulectomy patient to re-establish occlusion on the normal side, thereby improving masticatory efficiency and enhancing quality of life.

II. Case Report

A 41 years old male patient came to the department of prosthodontics, crown and bridge with a chief complaint of difficulty in mastication. His medical history revealed that he had history of squamous cell carcinoma on left side of face and 2 years back has undergone left hemimandibulectomy, left inferior maxillectomy and left modified radical neck dissection with radiotherapy with a total dose of 6000cGy/30fractions over 6 weeks using 6MV x-rays on Halcyon Linear Accelerator (LA3DCRT).

Extra-oral examination of the patient revealed gross facial asymmetry with deviation of mandible towards the left side and inferior rotation of the mandible with surgical scar on left side of face. Intra oral examination revealed partially edentulous in relation to missing 22, 23, 24, 25, 26, 27, 32, 33, 34, 35, 36, 37 with resected maxilla and mandible distal to 21 and 31, respectively. It also revealed loss of alveolar ridge, and obliteration of buccal and lingual sulci in the left half of mandibular region intraorally Post radiation therapy mucositis and xerostomia was also present. The patient had reduced mouth opening to 11 mm. The patient was unable to attain an appropriate mediolateral mandibular position, with a 1 mm scissor bite observed after guided closure. Additionally, the patient could not independently reproduce this position during mastication.

This represents class III of Cantor and Curtis classification for mandibular defect, as the defect involves loss up to the mandible midline region.

Preliminary impressions were made using irreversible hydrocolloids (2002, Dentsply) using a plastic perforated stock tray. Impressions were poured in type 3 gypsum material (Kalstone; Kalabhai Karson), and casts were obtained. The maximum interocclusal record was made using bite registration wax. The casts were mounted on a mean value articulator with the help of an interocclusal record. The Adams clasp was fabricated on 46, and a C-clasp on 44 using 19-gauge orthodontic stainless-steel wire. The flange extension was made on the buccal side from the maxillary canine to the maxillary second molar on the unaffected side using clear self-cure acrylic resin (DPI Cold cure clear; Dental Products of India, Mumbai, India). Accordingly, a smooth gliding flange surface was developed intraorally to guide the mandible into occlusion. Care was taken to maintain the buccal-surface indentations of the opposing maxillary teeth to direct the mandible toward a definite closing point during mastication. The flange height was carefully adjusted to provide a smooth, unhindered path from the opening position to maximum intercuspation. The guiding prosthesis then finished and polished. Try-in and adjustments done of the guiding prosthesis. The prosthesis was delivered and postinsertion instructions given. Follow up at the regular interval of 3 months was done for 1 year.

Figure 1: Preoperative Patient Profile

Figure 2: Preoperative intraoral view

Figure 3: preoperative intraoral view showing deviation towards the affected side (left side)

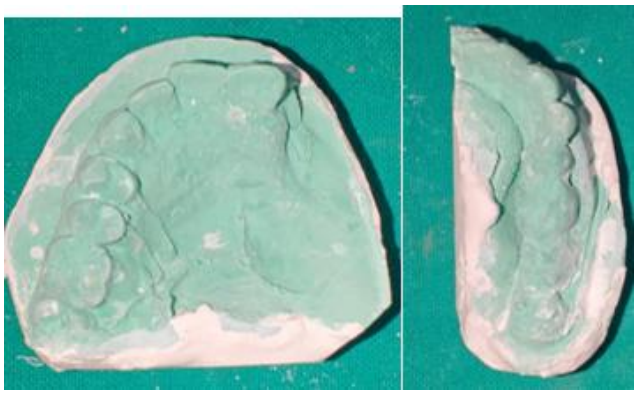

Figure 4: cast fabrication

Figure 5: Fabrication of guiding flange prosthesis on articulator

Figure 6: postoperative intraoral view with maximum intercuspation using a guiding flange prosthesis.

III. Discussion

Squamous cell carcinoma (SCC) of the oral cavity remains one of the most common malignancies of the head and neck region, with the mandible frequently involved due to its close anatomical relationship with the oral mucosa. Surgical resection is the primary treatment modality in advanced lesions, and although it offers effective tumor control, it often necessitates segmental mandibulectomy, resulting in unilateral loss of mandibular continuity.

Such resections invariably cause deviation of the mandible toward the resected side due to muscular imbalance, leading to loss of intercuspation and compromised masticatory function. In addition to functional difficulties, patients experience impaired speech, swallowing problems, and salivary incompetence. The esthetic disfigurement following mandibular resection further contributes to psychological distress and social withdrawal, significantly lowering the patient's quality of life.

Rehabilitation of these patients poses unique challenges. Guidance prostheses, such as guiding flange or palatal ramp appliances, are useful in retraining mandibular movements and establishing occlusal contacts on the unaffected side. These appliances can improve masticatory efficiency and speech intelligibility if initiated early during the postoperative phase. However, the success of prosthodontic rehabilitation depends on multiple factors, including the extent of resection, type of reconstructive surgery performed, and the patient's neuromuscular adaptability.

In cases where continuity defects are extensive, microvascular free flap reconstruction or bone grafting is often required to re-establish mandibular form and provide a foundation for definitive prosthetic rehabilitation. A multidisciplinary approach involving oncologic surgeons, prosthodontists, speech therapists, and psychologists is therefore essential to restore both function and esthetics, ultimately improving the long-term survivorship experience of SCC patients.

IV. Conclusion

The squamous cell carcinoma leads to Unilateral mandibular continuity defects resulting in mandibular deviation, loss of occlusion, functional impairment, and facial disfigurement. Prosthetic rehabilitation,

particularly with guiding flange prostheses, can effectively retrain mandibular movements and improve mastication, speech, and esthetics. The overall success depends on the extent of the defect, reconstructive support, and patient cooperation, highlighting the importance of a multidisciplinary approach for restoring function and quality of life.

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