

A Novel Fixed Guiding Plane Prosthesis for Hemimandibulectomy Patient

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Abstract

Resection of tumors of the tongue, floor of the mouth, and mandible results in functional disability and cosmetic disfigurement which presents a major challenge to the rehabilitation team and the maxillofacial prosthodontics. The unilateral loss of mandibular continuity due to surgery or trauma results in mandibular deviation toward the defect side resulting in loss of occlusion on the unresected side. Mandibular resections also result in impaired speech articulation, difficulty in swallowing, mandibular deviation, poor control of salivary secretions, and severe facial disfigurement. A guiding flange guides the resected mandible into the correct position. Guiding flange made of acrylic polymers which lack the principles of removable partial denture design may affect the longevity of the remaining teeth. A guiding flange attached to a fixed partial denture was fabricated to be used as a long-term prosthesis restoring reasonable function and appearance.

Key words: Fixed guiding plane prosthesis, hemimandibulectomy, guiding plane prosthesis, and oral carcinoma

INTRODUCTION

Segmental resection of the mandible results in significant physiological and esthetic problems, especially if condylectomy has been performed. The most important difficulty encountered is mandibular deviation toward the defective side.^[1]

The earlier the mandibular guidance therapy is initiated in the course of treatment, the more successful is 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.^[2,3]

CASE REPORT

A 49-year-old male patient was reported to the Department of Prosthodontics Crown and Bridge and Implantology, Rishiraj College of Dental Sciences and Research Center Bhopal, after surgical resection and radiation of squamous cell carcinoma involving left retromolar trigone.

The patient underwent surgical resection 5 years ago, with the chief complaint of inability to chew, impaired speech, difficulty in swallowing, and mandibular deviation on the left side (affected side).

Examination

Extraoral examination revealed an asymmetric ovoid face, facial paralysis on the left side due to facial nerve resection, and deviation of the mandible to the left side [Figure 1].

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www.ijss-sn.com

Month of Submission : 05-2023
Month of Peer Review : 06-2023
Month of Acceptance : 06-2023
Month of Publishing : 07-2023

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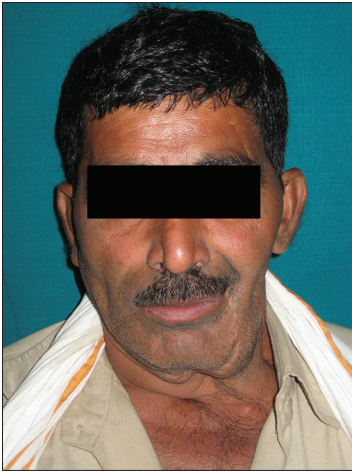


Figure 1: Pre-operative



Figure 2: Surgical scarring and fibrosis

On intraoral examination, there was a lack of proper contact between maxillary and mandibular teeth, a large mandibular defect on the left side, surgical scarring and fibrosis on the resected side [Figure 2], mouth opening and functional vestibular depth is reduced, and patient's maxillary arch was partially edentulous with missing 15,17,24,25,26, and 27.

Investigations

Orthopantomogram revealed resection of the mandible in the midline involving ramus, condyle, and coronoid process of the left side [Figure 3].

This represents Class III mandibular resection according to Cantor and Curtis classification.^[1]

Treatment Plan

On the basis of examination and investigation, prosthetic rehabilitation was decided in two parts: the first one was to get an acceptable occlusion relationship and then the rehabilitation of the missing structure.

while selecting a treatment plan for acceptable occlusal function many types of the prosthesis was suggested to the patient which includes positioning prosthesis with palatal flange, widened maxillary occlusal table, acrylic splint Herbst, maxillary inclined plane prosthesis, mandibular lateral/oblique guide flange prosthesis, etc.,^[4] as the patient was not agreeing for removable prosthesis; thus, a fixed guiding flange was decided.

After extensively searching the literature for a fixed guiding prosthesis, it was found a fixed prosthesis which is proposed by Nelogi *et al.*,^[5] which is composed of a loop and a molar band. The only pre-condition of this appliance is that it would require opposing teeth; unfortunately, in the present case, the maxilla was partially edentulous.

Hence, it was decided to give a conventional fixed partial denture along with a guiding flange.



Figure 3: OPG showing left hemimandibulectomy

Here, in this case, a fixed prosthesis that would prevent scar contraction by keeping muscles in the stressed condition and at the same time provide corrective and masticatory functions.^[6]

The first phase of treatment was the restoration of carious and conservative periodontal treatment and the second phase of treatment was to get the acceptable occlusion of the remaining teeth using a fixed guiding flange prosthesis.

Procedure

Tooth preparation was done with 14 and 17 to receive porcelain fused to the metal retainer and an elastomeric impression was made using (Xpress Putty and Light body 3M ESPE US) that cast was poured with type IV dental stone (Dentstone, Neelkanth's healthcare products, India).

Assisted and unassisted interocclusal records [Figure 4] were made with silicone-based interocclusal record material (ExabiteII NDS GC US) with the use of these records articulation which was done on the Hanau wide view semi-adjustable articulator [Figure 5].

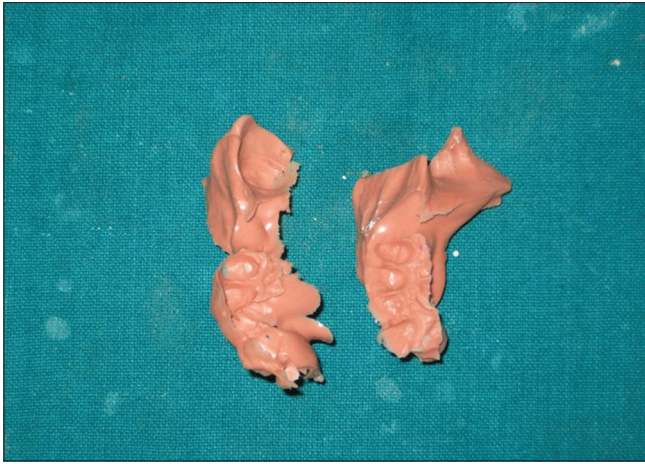


Figure 4: Assisted and unassisted interocclusal records



Figure 6: Temporary restoration with fixed guiding plane



Figure 5: Mounting on hanau articulator using inter occlusal records

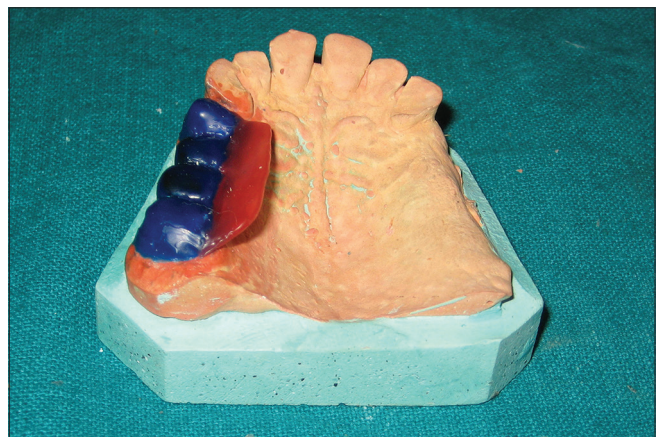


Figure 7: Wax pattern with guide plane

To test this concept of attaching a guide flange to a fixed bridge, it was decided to give a temporary restoration along with a fixed guide flange.

Auto-polymerized acrylic resin was added to the temporary restoration, when acrylic was in the dough stage mandible that is manipulated to achieve desired interocclusal relationship [Figure 6].

Cementation of the prosthesis was done with eugenol-free temporary luting cement. The patient was kept under observation for 1 month, gradual modification was done according to the patient's comfort level. The patient was quite satisfied with the final product.

A wax pattern was prepared and the guiding plane was attached to the pattern only [Figure 7], spruing and casting were done in a conventional manner.

Pontic was selected in such a way that there were self-cleansing areas so that the patient can maintain his oral hygiene using interdental brushes [Figure 8].



Figure 8: Self-cleansing space

It was also decided to attach the guide flange on the occlusal 3rd so that there was a space between flange and cervical area for easy oral hygiene maintenance.

Finally, the metal coping try-in and shade selection was done.

It was also decided to add tissue-colored ceramic to the flange of the prosthesis, thus making it more esthetically acceptable [Figure 9].



Figure 9: Final prosthesis with gingival colored guide plane



Figure 10: Post-operative view of prosthesis

At last final occlusal correction was done and the prosthesis was cemented with type I glass ionomer cement (type I GIC GC US) [Figure 10]. After cementation, the patient is recalled every day for the next 1 week to evaluate any pain or strain in TMJ and muscle.

DISCUSSION

The proposed fixed guide flange is recommended for those patients with significant mandibular resection who have limited mouth opening ability resulting from tissue scarring and who lack the motor skill to manage a removable prosthesis.

The technique is proposed only when the remaining teeth are periodontally sound enough to bear the angular pull of muscles and masticatory forces. The fixed guide flange proposed is functional, esthetic, and comfortable.

After the placement of a fixed mandibular guide flange prosthesis, the patient must be evaluated for any strain or pain in the temporomandibular joints and muscles.

CONCLUSION

The proposed guide flange is a simple alternative to the removable mandibular guide flange prosthesis further research should focus on determining the influence of the fixed guide flange on the maxillary teeth and any long-term adverse effects of its use.

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How to cite this article: Tomar BS, Singh S, Gupta S, Shrivastava A, Niranjan B, Vajpayee S. A Novel Fixed Guiding Plane Prosthesis for Hemimandibulectomy Patient. *Int J Sci Stud* 2023;11(4):1-4.

Source of Support: Nil, **Conflicts of Interest:** None declared.