Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies **NLM ID:** 101716117

Journal home page: www.jamdsr.comdoi: 10.21276/jamdsr Indian Citation Index (ICI) Index Copernicus value = 91.86

(e) ISSN Online: 2321-9599;

(p) ISSN Print: 2348-6805

Case Report

Guiding Flange Prosthesis; Means To Restore Muscle Engram: A Case Report

¹Krishnapriya Singh Nagtilak, ²SulabhKumar, ³Pratibha Yadav

^{1,3}Post graduate student, ²Senior Lecturer, Dept of Prosthodontics Crown and Bridge, Babu Banarasi Das College of Dental Sciences, Lucknow, Uttar Pradesh, India

ABSTRACT:

Mandibular discontinuity defects after a segmental surgery poses a major challenge for a prosthetic rehabilitation. As a result of undergoing surgery there is deviation of mandible towards the resected side which result in loss of occlusion on the non-resected side. This leads to severe cosmetic disfigurement, impaired speech, difficulty in swallowing& mastication. The present case report illustrates a prosthodonticmanagement of patient with mandibular guiding flange prosthesis. **Keywords**: Hemimandibulectomy, Guiding Flange Prosthesis, Squamous Cell Carcinoma.

Received: 18 February, 2022

Accepted: 23 March, 2022

Corresponding author: Krishnapriya Singh Nagtilak, Post graduate student, Dept of Prosthodontics Crown and Bridge, Babu Banarasi Das College of Dental Sciences, Lucknow, Uttar Pradesh, India

This article may be cited as: Nagtilak KS, Kumar S, Yadav P. Guiding Flange Prosthesis; Means To Restore Muscle Engram: A Case Report. J Adv Med Dent Scie Res 2022;10(4):44-47.

INTRODUCTION

Squamous cell carcinoma (SCC) represents 90% to 95% of all malignant neoplasms of the oral cavity, mostly affecting men aged> 40 yrs, having history of heavy tobacco consumption.

Mandible is the most common site for intraoral tumors as compared to maxilla, which often requires the resection of large portion of the mandible. Disabilities resulting from such resections include impaired speech, difficulty in swallowing and deviation of mandible during functional movements and severe cosmetic disfigurement.Both form and function should be considered in rehabilitating hemimandibulectomy patients.

The Guide flange prosthesis (GFP) is a mandibular conventional prosthesis designed for the patient who isable to achieve an appropriate mediolateral position of the mandible but is unable to repeat this position consistently for adequate mastication.^[1]Through this appliance, muscles get stretched and strengthened so that normal occlusal relationship can be obtained.

Presentcase report describes early prosthodontic management of a patient who has undergone right side hemimandulectomy withGFP combined with physiotherapy to correct deviation of mandible thereby improving mastication, esthetics and speech and thus enhancing the better quality of life.

CASE PRESENTATION

A 41 yrs old male patient was referred to the Department of Prosthodontics (Babu Banarasi Das College of Dental Sciences, Lucknow) with the chief complaint of difficulty in mastication due to deviation of the mandible towards the right (defective side), thus causing disocclusion of the teeth on the left (normal side).

A detailed case history revealed that the patient was diagnosed with Squamous cell carcinoma of gingivabuccal sulcus of right side of mandible. The patient had undergone hemimandibulectomy in right buccal mucosa two month back and defect was reconstructed with Pectoralis major myocutaneous (PMMC) flap. Intermaxillary fixation was not performed at the time of surgery.

Extra oral examination revealed facial asymmetryand deviation of mandible towards the rightside (resected side). (Fig 1) The mouth opening was further reduced to 25 mm.

Figure 1 - Facial Asymmetry



Intra oral examination revealed partially edentulous mandible with scar formation, loss of alveolar ridge, loss of occlusal contact and obliteration of buccal and lingual sulci in right side of mandibular region. (Fig2).

Figure 2 - Midline shift and loss of occlusion contact



The deviation of mandible towards the right side (10-12mm from midline) on opening due to action of the normal left mandibular depressor muscle.

Further observed that mandible can be guided to centric occlusion manually, but the patient could not achieve this position consistently on his own. Hence objective of recommended treatment was to correct the deviation of mandible and to restore proper occlusion for mastication.

METHOD

A maxillary and mandibular impression was made with irreversible hydrocolloid (Mfg-Zelgan2002, dentsply, ISO9001) using a modified plastic stock tray.^[2,3]The cast was poured with Type III Dental stone (Mfg -Gypstone, Super hard Dental TypeIII).^[4,5]A maxillomandibular record was made with modelling wax by manually assisting the mandible to centric occlusion. This record was transferred to articulator. Three clasps were made using 21 gauge orthodontic wire (Mfg-KC Smith and Co,UK) – pin head on canine and premolar; adams clasp on molar for retention purpose.^[4]The guide flange extended superiorly and buccally on the buccal surface of premolar and molar, allowing the normal horizontal and vertical overlap of the left maxillary anterior teeth.

Considering the load of deviation and reduction in mouth opening, mandibular Guiding flange prosthesis was fabricated on the non-defect side using clear heat-polymerized acrylic resin (DPI Heat Cure clear; Dental products of India).^[3] After applying sufficient separating medium, the resin was added on buccal and lingual aspect of non-defect side of mandible and on the defect side the extension was added till the maxillary buccal vestibule. The prosthesis was excised on patient mouth and checked for retention and stability. It was trimmed and adjusted accordingly. The mandible was guided to centric occlusion without delivering excessive force to maxillary teeth. Acrylic resin was added little by little to the guide flange until there was smooth guidance of the mandible to proper occlusion without any interference. The prosthesis was finished, polished and delivered to the patient.(Fig 3 a and b).

Figure 3a and b - Mandibular Guiding Flange Prosthesis



Figure 3aFigure 3b

After insertion of the prosthesis, midline coincided and occlusion was achieved (Fig 4).

Figure 4 -Correction of deviation after insertion of the prosthesis.



The patient was advised to use the Guiding Flange throughout the day except at night. Physiotherapy exercises were also recommended. It included maximum mouth opening and grasping the chin to move the mandible away from surgical side. This will help in reducing trismus, minimize scar contracture and improve occlusion.

It is documented that; definite denture restoration is deferred until a definite maxilla-mandibular relationship is obtained or an end point mandibular guidance therapy is attained. Guidance prosthesis and interim partial denture function as training appliances till a cast partial denture can be fabricated for the patient.Followed up after a month, there was trivial reduction in the deviation.

DISCUSSION

India has the ignominy of world's highest occurrence (nearly 20%) of oral cancers, with an estimated 1% of the population having oral premalignant lesions. ^[6] There are various surgical treatment modalities such as segmental, marginal, hemi subtotal, and total mandibulectomy depending upon the location and extent of tumor in the mandible.^[3]

Segmental mandibulectomy as surgical treatment for squamous cell carcinoma results in deviation of the remaining mandibular segment towards the defect and rotation of mandibular occlusal plane inferiorly.^[7] This mandibular shift is due to the uncompensated influence of the contra lateral musculature, particularly the internal pterygoid muscle.^[8]

Deviation due to surgical resection can be reduced by immediate treatment such as intermaxillary fixation or mandibular and palatal guidance therapy followed by physiotherapy to reduce trismus and to loosen scar contracture.

Guide flange prostheses are used in patients with mandibular discontinuity to correct the resulting deviation of the mandible and achieve acceptable occlusal function.^[9] Mandibular guidance therapy begins after the postsurgical sequel has subsided.^[10] The guiding flange prosthesis can be regarded as a training prosthesis till a cast partial denture can be fabricated for the patient.^[4] This prosthesis assist the patient to close the mandible in correct intercuspal position without any external support.

The success of prosthetic rehabilitation depends on size and extension of the defect, myodynamics of the soft tissue, proprioception of the patient, number of remaining teeth for the support, extent of mouth opening, and severity of mandibular deviation.^[11]

The main objective is to re-educate the mandibular muscles to establish an acceptable occlusal relationship(physiotherapeutic function) for the residual hemimandible hence the patient can control the opening and closing of the mandibular movements adequately and repeatedly.^[5]

Along with the guidance therapy patient was asked to perform certain exercises two week after surgery to lessen the scar contracture, reduce trismus, and improve maxillomandibular relationship. During the mouth opening, mandible is moved forcefully by hand towards the non-resected side as much as possible. Prosthesis can be discontinued if the patient is able to repeat the mediolateral position successfully.

CONCLUSION

After the surgical intervention it is important for the prosthodontist to restore the abusedstomatognathic system for the normal physiological functions of the oral activities. Guiding flange prosthesis is a training device that aids to minimize complications associated with speech, deglutition, mastication and also helps to re-establish the aesthetics by preventing the deviation of the mandible towards the resected side. It is easy to fabricate, cost effective and provide long term successful patient satisfaction.

FINANCIAL SUPPORT AND SPONSORSHIP Nil

CONFLICTS OF INTEREST

The authors of this manuscript declare that they have no conflicts of interest.

ACKNOWLEDGEMENTS

The Author expresses sincere and heartful thanks to my guide, Dr. Sulabh Kumar MDS, Professor, Department of Prosthodontics, Babu Banarasi Das College of Dental Sciences Lucknow. Author would like to express her gratitude to Dr. Suryakant NagtilakProfessor and Head of Department of Biochemistry GMC Silvassa (UT)for his guidance during the research process, without your help this article would not have come to fruition. The Author would also acknowledge her parents and husband for their love and constant support.

REFERENCES

- Nagtilak KS, Upadhyay A, Yadav P. Guiding flange prosthesis; means to restore muscle engram. Abstract of research paper presented at 21st IPS (Indian Prosthodontic Society) Convention proceedings held at Narsinbhai Patel Dental College & Hospital, Visnagar, Gujrat on 16th-19th April 2019.
- Singh B, Sinha N, Rohitsharma , parekh N.Non-Surgical Correction of Mandibular Deviation and Neuromuscular Coordination after Two years of Mandibular Guidance Therapy: A Case Report.J Clin of Diagn Res.2015; 9(11):ZD07-ZD09.
- Bandodkar S, Arya D, Singh SV, Chand P. Guide flange Prosthesis for management of hemimandibulectomy. Natl J Maxillofac Surg 2021;12:289-93.
- 4. Gupta S, Mishra P, Shivakumar GC. Guided Flange prosthesis; A non-surgical aid for hemi mandibulectomy patient: A case report. J Dent Specialities,2015;3(1):117-119
- 5. Kar S, Tripathi A, Madhok R. Treatment outcome with guiding flange prosthesis in hemimandibulectomy patients: Case series of three patients. Ann Maxillofac Surg 2015;5:266-70.
- Chaturvedi P. Effective strategies for oral cancer control in India.J Cancer Res Ther 2012;8Suppl 1:S55-6.
- Sahin N, Hekimoglu C, Aslan Y. The fabrication of cast metal guidance flange prostheses for a patient with segmental mandibulectomy: A clinical report. JProsthet Dent 2005;93:217-20.
- Gupta SG, Sandhu D, AroraA, Pasam N. The use of mandibular guidance prosthesis to correct mandibular deviation following hemimnadibulectomy – Case reports. Indian J Dent Res Rev 2012;2:71-3.
- 9. Geramipanah, Farideh1; Fallahi Sichani, Saman2; Mirmohammadrezaei, Susan1; Ghodsi, Safoura3,

Practical guidelines for fabricating mandibular guide flange prostheses, Prosthetics and Orthotics International: August 2016 - Volume 40 -4 528-531.

- 10. Babu S, Manjunath S, Vajawat M. Definitive guiding flange prosthesis: A definitive approach in segmental mandibulectomy defect. Dent Res J 2016;13:292-5.
- 11. Kusugal P, Kalaivani VN, Patil A, Krishnamurthy S, Ruttonji Z. An innovative technique for the fabrication of fixed removable guide flange prosthesis for lateral mandibular resection. Dent Res J 2020;17:80-3.