



CAST MANDIBULAR GUIDING FLANGE PROSTHESIS IN AN ACQUIRED MANDIBULAR DEFECT: A CASE REPORT.

S.R.N. Venkata Harish. V¹, Sri Harsha Pudi², T. Ashish³, Vudi Srinivas⁴, B N Venkata Kanaka Dinesh Kumar⁵, P.v.b. Chandra Sekhar⁶

Abstract:

Tumours in and around the mandible usually require surgical removal of the lesion and extensive resection of the bone. Smaller lesions removed without discontinuity of the bone are relatively simple to restore with prosthesis. Larger lesions that extend to the floor of the mouth may be more difficult to restore with prosthesis even though the continuity of the mandible is maintained. Acquired mandibular deviation following surgical resection of the mandible can affect the normal masticatory function, speech and esthetics. This clinical report describes the fabrication of a cast metal guiding flange prosthesis, which could be used as a suitable alternative to the conventional resin guiding flange prosthesis in correcting mandibular deviation.

Key Words: Mandibular resection, Mandibular Deviation, Guiding flange prosthesis

¹*Reader, Department of Prosthodontics and Crown & Bridge, GSL Dental College and Hospital, Rajamahendravaram. Andhra Pradesh. Mail.id: venkataharish94@gmail.com

²Reader, Department of Prosthodontics and Crown & Bridge, MNR Dental College and Hospital, Sangareddy, Hyderabad, India

³Senior lecturer, Department of Prosthodontics and Crown & Bridge, GSL Dental College and Hospital, Rajamahendravaram, Andhra Pradesh.

⁴Senior lecturer, Department of Prosthodontics and Crown & Bridge, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam, Andhra Pradesh.

⁵Senior lecturer, Department of Prosthodontics and Crown & Bridge, Drs. Sudha & Nageswara Rao Siddhartha Institute of Dental Sciences(sndc), Vijayawada, Andhra Pradesh

⁶Senior lecturer, Department of Prosthodontics and Crown & Bridge, GSL Dental College and Hospital, Rajamahendravaram, Andhra Pradesh.

Corresponding Author: Dr. Sriharsha

*Reader, Department of Prosthodontics and Crown & Bridge, MNR Dental College and Hospital, Sangareddy, Hyderabad, India

DOI:- 10.48047/ecb/2023.12.si10.00237

INTRODUCTION:

Acquired mandibular deviation is a serious complication following surgical resection of the mandible, which can significantly jeopardize the normal masticatory function, speech and esthetics¹. Surgical resection is the primary modality of treatment of benign, neoplastic and cystic lesions involving the mandible and adjoining orofacial tissues. Following surgery and subsequent soft tissue repair, there is a severe imbalance in muscular factors contributing to normal jaw function leading to loss of symmetry, alterations of opening and closing patterns and moderate to severe mandibular deviation is an inevitable sequelae². The patient experiences considerable difficulty in mastication as the teeth in opposing

arches fail to occlude precisely due to the severe mandibular deviation present³.

In addition to this, patients also experience a significant psychological trauma and the clinician often plays a key role in alleviating this suffering by restoring the mandibular deviation, thus facilitating effective mastication and occlusion.

CASE REPORT:

A 35 year old male, reported to Department of Prosthodontics- Saveetha dental college and hospital, with chief complaint of marked mandibular deviation to the right side and inability to chew (Fig 1a).



Figure 1: 1a. Extraoral appearance with mandibular deviation. 1b. Surveying the master cast. 1c. Resin mandibular guiding flange

History revealed patient has under went partial resection of the mandible for squamous cell carcinoma in the buccal mucosa of the cheek on right side with the tumour infiltrating the body of mandible. Clinical examination revealed absence of the mandibular segment on the right side with complete obliteration of buccal and lingual vestibular sulci on the right side with the absence of canine, premolars and molars. On palpation, intra oral soft tissues were firm with extra oral scar tissue formation. On opening the mouth, a severe mandibular deviation upto 25mm from midline was observed towards resected right side. There was disruption of occlusion on left side. Salivation was normal and mouth opening restricted to 25mm. Radiographic examination with OPG revealed a Class III type of Cantor and Curtis mandibular defect. Patient was explained about treatment options. Surgical debonding of scar tissues and Surgical reconstruction with bone grafts followed by implant supported definitive prosthesis. Till that period a cast mandibular guiding flange prosthesis to be given to correct mandibular deviation and restore occlusion and mastication.

CLINICAL PROCEDURE:

Mouth opening was 25mm, hence the selected stock stainless steel tray was cut and modified on right side and tried in patients mouth and primary impressions were made with irreversible hydrocolloid (Tulip alginate impression material, Cavex, Holland) and cast poured with type III dental stone (Kalstone, Kalabhai Karson pvt ltd, Mumbai). The special tray was constructed in the stone after blocking out undercuts with plaster of paris and a wax spacer (Hindustan Modelling Wax No 2, Hindustan dental products, Hyderabad) of 2mm thickness was provided and final impression was made with putty (Aquasil soft putty/ Regular set, DENTSPLY, Germany) and light body (Aquasil Ultra LV, DENTSPLY, Germany) addition silicone and cast poured with Type IV stone (Ultrarock, Kalabhai Karson pvt ltd, Mumbai). The master cast was retrieved, surveyed (Fig 1b) the height of contour marked over the abutment and suitable undercuts were identified and blockouts were done in suitable areas.

Facebow transfer, jaw relation and inter occlusal records were made and casts were mounted in Hanau wide vuese semi adjustable articulator (Hanau

Wide-Vue Arcon 183-2, whipmix corporation, USA). Lingual and buccal mandibular plate major connector were designed and were connected with 21 gauge wrought wires. 19 gauge wrought wires were bent into U loops to constitute the guiding flange and were stabilised in wax patterns of the buccal side and the loops extended 2mm short of the maxillary vestibule and 2mm away from the alveolar mucosa in the maxillary arch. The resin major connector were fabricated using autopolymerising resin (DPI RR Cold cure, Dental Products of India, Mumbai) (Fig 1c) and the appliance was tried in patients mouth (Fig 2a) and an interim acrylic mandibular guiding flange was delivered.

Resin pattern was fabricated in the master cast, light cured, retrieved and cast with Co-Cr alloy (WIRONIUM Extra Hard, BEGO, Germany) and tried in patients mouth (Fig 2a). Then a 19 gauge wrought wire was bent into loops was laser welded (Laser star, Laser star technologies corporation, USA) to buccal plate major connector and tried in patients mouth. There was a significant reduction in mandibular deviation (Fig 2c) with good retention and stable occlusal contacts with restoration of function. Patient was reviewed periodically and patient expressed extreme satisfaction with the prosthesis.



Fig 2: 2a. Frame work tryin for cast mandibular guiding flange, 2b. Frame work with laser soldered vestibular extension loops. 2c. Intraoral position of cast mandibular guiding flange

DISCUSSION:

Management of mandibular deviation following mandibular resection has been a challenging task for clinicians. The various modalities of management include cap splints with vestibular extensions, gunning splints⁴ intermaxillary fixation with wires⁵, orthodontic elastics and mandibular guiding flange prosthesis. Splints with extensions suffered from retention and stability problems and also increased the vertical dimension of the face. Elastics and wires could not achieve adequate correction of deviation and cannot be used in period on tally compromised conditions. The commonly used modality of treatment is the Guiding flange prosthesis⁶. Conventionally this prosthesis is constructed in autopolymerising resin. Apart from its marked success over the afore mentioned treatment modalities, acrylic guiding flange prosthesis also suffered certain limitations. The autopolymerising resin resulted in varying levels of porosity which compromises the strength of resin and also harbours microorganisms. The increased thickness to accommodate the wrought wire components encroached more lingual and buccal spaces and resulted in difficulty in speech. Also the chances of fracture is more in acrylic prosthesis. These difficulties could be overcome by constructing a cast guiding flange^{7,8} which has markedly improved strength than acrylic. The bulk

of the prosthesis also gets considerably reduced and better comfort is ensured. The metal is highly resistant to fracture, thus enhances durability of the prosthesis and metal is also a good conductor of heat, the patient can experience the perception of food better. This prosthesis guides the mandible and effectively enhances occlusal equilibrium and enables better mastication of food. The chances of porosity, water sorption, polymerisation shrinkage are negligible in all metal prostheses. Repair is possible by soldering techniques. The limitations of cast guiding flange include more time with additional laboratory steps involved in casting and increased cost to the patient. Cast guiding flange may not be suitable in patients who are allergic to metals and alloys. Further modifications in this appliance could be done by incorporating the swing lock design and precision attachments. Hence the cast mandibular guiding flange prosthesis could be used as an effective treatment option in management of mandibular deviation in resected mandibular defects.

CONCLUSION:

The cast metal guiding flange prosthesis offers more resistance to fracture, support to the tissues and better comfort to the patient, hence it could be used as a suitable alternative to the conventional

resin guiding flange prosthesis in correcting mandibular deviation in resection defects.

REFERENCES:

1. Beumer J, Curtis T, Marunick M. Maxillofacial rehabilitation: prosthodontic and surgical considerations. St Louis: Ishiyaku Euro America, Inc.; 1996:240-285.
2. Marunick MT, Mathes BE, Klein BB. Masticatory function in hemimandibulectomy patients. *J Oral Rehabil*; 1992 May;19(3):289-95.
3. Schneider RL, Taylor TD. Mandibular resection guidance prostheses: A literature review. *J Prosthet Dent*;1986 Jan;55(1):84-6.
4. Fattore L, Marchmont – Robinson H, Crinzi RA, Edmonds DC, Use of a two piece Gunning splint as a Mandibular guide appliance for a patient treated for Ameloblastoma. *Oral Surgery Oral Med Oral Pathol*;1988 Dec;66(6):662-5.
5. Aramany MA, Myers EN. Intermaxillary fixation following mandibular resection. *J Prosthet Dent*: 1977 Apr;37(4):437-44.
6. Hasanreisoglu U, Uçtasli S, Gurbuz A. Mandibular guidance prosthesis following resection procedures: Three case reports. *Eur J Prosthodont Rest Dent*;1992 Dec;1(2):69-72.
7. Sahin N, Hekimoglu C, Aslan Y. The fabrication of cast metal guidance flange prostheses for a patient with segmental mandibulectomy: a clinical report. *J Prosthet Dent*;2005 Mar;93(3):217-20
8. Sumanth Babu, Shaurya Manjunath, Mayuri Vajawat-Dent Res J (Isfahan). 2016 May-Jun; 13(3): 292–295.