Prosthetic Management of a Hemi-Mandibulectomy Patient

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Abstract

This case report describes the prostodontic management of a patient that has undergone hemimandibulectomy with a provisional training appliance followed by definitive flange prosthesis. The prostodontic rehabilitation of a patient with acquired mandibular defects is important as the balance and symmetry of mandibular function is lost. There is an altered mandibular movement and deviation of the residual fragment toward the defective side. Besides, there is difficulty in swallowing and impaired speech. A corrective device named “Guide Flange Prosthesis” is indicated to limit that clinical manifestation. A 32-year-old female patient with segmental resection of the left mandible without reconstruction (Class III) reported our department. She had deviated mouth opening and disturbed profile with facial asymmetry. A training appliance with a palatal ramp followed by a definitive mandibular cast partial denture with a guiding flange-in was planned for this patient.

Keywords: Guiding flange prosthesis, mandibular resection, maxillofacial prosthesis, palatal ramp, segmental mandibulectomy, training appliance

Introduction

Mandible is the most common site for intraoral tumors which often requires the resection of large portions of the mandible. If mandibular continuity is not restored during surgical closure of wound, the remaining mandibular segment will retrude and deviate toward the surgical side at the vertical dimension of rest. When the mouth is opened, the deviation increases, leading to an angular pathway of opening and closing. Other disabilities resulting from such resections include impaired speech, difficulty in swallowing, and severe cosmetic disfigurement. The mandibular deviation is mainly due to uncompensated influence of contralateral musculature, particularly the internal pterygoid muscle and pull from the contraction of cicatricial tissue on the resected side.

Cantor and Curtis have classified the mandibular defects into six categories. Several modalities to return the mandible to the optimum maxilla–mandibular relationship have been described. These include intermaxillary fixation, vacuum-formed polyvinyl chloride splints, mandibular guidance prostheses, and a widened maxillary occlusal table using a double row of teeth. Swoope proposed the use of a palatal ramp and Rosenthal suggested the use of two rows of maxillary posterior teeth on unresected side. Mathew A and Thomas S delivered a guiding flange prosthesis (GFP) to a hemi-mandibulectomy patient. Out of the various prosthetic treatments, the appropriate option should be selected depending on the clinical situation. Robinson et al. in 1964 stated that fabrication of a provisional GFPs facilitates the fabrication of a definitive restoration. GFP is a mandibular conventional prosthesis designed for the patient who is able to achieve an appropriate mediolateral position of the mandible but is unable to repeat this position consistently for adequate mastication.

This case report describes the prostodontic management of a patient who has undergone a hemimandibulectomy with Class II defect. A palatal ramp training appliance was fabricated followed by definitive prosthesis as cast partial denture with a mandibular guiding flange.

Case Report

A 32-year-old female patient reported to our department with deviated mandible for functional and esthetic recovery. The patient gave a history of a large swelling on the left side for 2 years which was later diagnosed as cemento-ossifying fibroma. This case report describes the prostodontic management of a patient with acquired mandibular defects. The balance and symmetry of mandibular function is lost. There is an altered mandibular movement and deviation of the residual fragment toward the defective side. Besides, there is difficulty in swallowing and impaired speech. A correcting device named “Guide Flange Prosthesis” is indicated to limit that clinical manifestation. A 32-year-old female patient with segmental resection of the left mandible without reconstruction (Class III) reported our department. She had deviated mouth opening and disturbed profile with facial asymmetry. A training appliance with a palatal ramp followed by a definitive mandibular cast partial denture with a guiding flange-in was planned for this patient.

Keywords: Guiding flange prosthesis, mandibular resection, maxillofacial prosthesis, palatal ramp, segmental mandibulectomy, training appliance

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was followed by a surgical procedure which involved segmental resection of the left mandible without reconstruction. The defect was Class II according to Cantor and Curtis classification. On extraoral examination, there was severe deviation of the mandible toward left side [Figure 1a and b]. There was deviated mouth opening and disturbed profile with facial asymmetry [Figure 1c]. Mouth opening was found to be reduced to 25 mm, and mandibular deviation of 18–20 mm toward left side was found on opening of jaw. Intraoral findings included missing lower left premolars and molars with mandibular second molar missing on the right side [Figure 2a and b]. There was no occlusal contact accompanied with trismus and excessive salivation with drooling.

A training appliance with a palatal ramp followed by a definitive mandibular cast partial denture with a guiding flange-in was planned for this patient.

Upper and lower alginate impressions (Dentalgin; Prime dental products, Mumbai, Maharashtra, India) were made and poured (Kalstone; Kalabhai Karson, Mumbai, Maharashtra, India). A training appliance retained with four circumferential clasps with 21-gauge orthodontic wire (KC Smith and Co., Monmouth, UK) on maxillary first premolars and second molars was constructed with autopolymerizing acrylic resin (DPI self-cure Dental products of India, Mumbai, Maharashtra, India) [Figure 2c]. A palatal ramp on the right (unaffected) side was constructed chair side to guide the mandible into occlusion [Figure 2d]. For the definitive prosthesis, the mandibular diagnostic cast was surveyed and designed for cast partial denture. Mouth preparation was done. Final impression was made with monophase addition silicone (Aquasil Ultra Monophase, Dentsply) in acrylic custom tray. The master cast was poured in die stone (Type IV) (Kalrock, Kalabhai Karson, Mumbai, Maharashtra, India). Block out of the master cast was done with blocking wax. Wax pattern was fabricated with LIWA system [Figure 3a]. Metal framework was obtained after casting [Figure 3b], and metal try-in was done in the patient’s mouth. Jaw relations were recorded followed by teeth arrangement and try-in. A guiding flange was fabricated with modeling wax (Modeling wax; Deepti Dental Products, Ratnagiri, India), leaving 2–3 mm space from maxillary teeth simultaneously not affecting esthetics and function. [Figure 3c] The complete assembly was cured (DPI Heat cure, Dental products of India, Mumbai, Maharashtra, India). Final prosthesis was delivered [Figure 4a]. The patient was trained to use the prosthesis, and postinsertion instructions were given. The patient was followed up at a regular interval of 2 months for the next 1 year. Marked improvement was noted in the esthetics of the patient extraorally, and occlusal contacts were also maintained that improved the function of the patient [Figure 4b].

**Discussion**

The basic rehabilitation objective in this case was to re-educate mandibular muscles to re-establish an acceptable occlusal relationship (physio-therapeutic function) for residual mandible and to restore the mastication. The mandibular
guidance therapy should be initiated at an early stage for more successful definitive occlusal relationship.[11] Any delays in the initiation of mandibular guidance appliance therapy, due to reasons such as extensive tissue loss, radiation therapy, radical neck dissection, flap necrosis, and other postsurgical morbidities may result in an inability to achieve normal maxilla–mandibular relationship.[10] An implant-supported prosthesis could not be considered since no bone graft was used. Palatal guiding appliance serves as a training appliance till a cast partial denture can be fabricated for the patient. If the patient closes the jaws in proper occlusion, the appliance can often be discontinued and changed with a definite denture.[13] The guiding flange which rides on the buccal surfaces of several of the maxillary teeth is the mechanical system which prevents the mandible from turning toward the resected side.[14] In this way, the cast partial denture with guiding flange maintained the mandible in its position and also aided in chewing by holding the occlusal contacts. LIWA system, used for fabrication of pattern for partial denture framework, is a light-polymerizing pattern wax. It has low contraction value and eases the pattern fabrication on the master cast.[15]

**Conclusion**

In patients who have undergone mandibular resection, correct intercuspal position can be accomplished with the early use of a training appliance to guide the mandibular position followed by definitive prosthesis with guiding flange. The cast partial denture with guiding flange maintains the mandible in its position and also aids in chewing by holding the occlusal contacts.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Beumer J 3rd, Curtis TA, Marunick MT. Maxillofacial Rehabilitation: Prosthodontic and Surgical Consideration. St. Louis: Ishiyaku Euro America; 1996. p. 113-224.
2. Beumer J, Marunick MT, Esposito SJ. Maxillofacial Rehabilitation. 3rd ed. USA. Quintessence; 2011. p. 87-9, 118-20.
3. Moore DJ, Mitchell DL. Rehabilitating dentulous hemimandibulectomy patients. J Prosthet Dent 1976;35:202-6.
4. Fonsica RJ, Davis WH. Reconstruction Preprosthetic Oral and Maxillofacial Surgery. 2nd ed :Philadelphia W.B. Saunders Company; 1985. p. 1063-7.
5. Aramany MA, Myers EN. Intermaxillary fixation following mandibular resection. J Prosthet Dent 1977;37:437-44.
6. Monaghan AM, Bear AS. A simple appliance to correct mandibular deviation following hemimandibulectomy. Br J Oral Maxillofac Surg 1990;28:419-20.
7. Prakash V. Prosthetic rehabilitation of edentulous mandibulectomy patient: A clinical report. Indian J Dent Res 2008;19:257-60.
8. Swoope CC. Prosthetic management of resected edentulous mandibles. J Prosthet Dent 1969;21:197-202.
9. Rosenthal LE. The edentulous patient with jaw defects. Dent Clin North Am 1994;8:773-9.
10. Mathew A, Thomas S. Management of a heni mandibulectomy defect with a definitive guiding flange prosthesis. Pushpapiri Med J 2012;3:132-34.
11. Robinson JE, Rubright WC. Use of a guide plane for maintaining the residual fragment in partial or hemi mandibulomectomy. J Prosthet Dent 1964;14:992-9.
12. Desjardins RP. Occlusal considerations for the partial mandibulomectomy patient. J Prosthodont 1979;41:308-15.
13. Beumer J, Curtis T A, Firtell DN, editors. St Louis: Mosby; 1979. Maxillofacial Rehabilitation: Prosthodontic and Surgical Considerations: p. 90-169.
14. Ufuk H, Sadullah U, Ahyan G. Mandibular guidance prosthesis following resection procedures: Three case reports. Eur J Prosthodont Restor Dent 1992;1:69-72.
15. Takaichi A, Wakabayashi N, Igarashi Y. Prefabricated light-polymerizing plastic pattern for partial denture framework. Contemp Clin Dent 2011;2:402-4.