

Twin Occlusion: A Solution to Rehabilitate Hemimandibulectomy Patient—A Case Report

Swatantra Agarwal · Praveen G ·
Samarth Kumar Agarwal · Sankalp Sharma

Received: 12 May 2011 / Accepted: 2 August 2011 / Published online: 12 August 2011
© Indian Prosthodontic Society 2011

Abstract Loss of continuity of the mandible destroys the balance and symmetry of mandibular function, leading to altered mandibular movements and deviation of the residual fragment towards the resected side. Prosthodontic treatment along with physical therapy may be useful in reducing mandibular deviation and improving masticatory efficiency. Numerous prosthetic methods are employed to minimize deviation and improve masticatory efficiency which includes implant supported prosthesis, mandibular guide flange prosthesis, and palatal based guidance restoration. This article describes rehabilitation of hemimandibulectomy patient using twinned teeth (two rows of teeth) on the unresected side in the maxillary edentulous arch for whom implant supported prosthesis, mandibular guide flange prosthesis or palatal based guide flange prosthesis cannot be fabricated to improve the masticatory efficiency.

Keywords Twin occlusion · Paired teeth · Dual occlusion

Introduction

Functional rehabilitation of patient who has a partially resected mandible is one of the most challenging procedures confronting the maxillofacial prosthodontist. Loss of continuity of the mandible destroys the balance of the mandibular movement and function, leading to altered mandibular movement and deviation of the residual

fragment towards the surgical side [1, 2]. The greater the loss of tissue, greater will be the deviation of the mandible to the resected side, thus compromising the prognosis of the treatment [1, 2]. Apart from deviation of mandible to resected site, other dysfunctions observed are difficulty in mastication, swallowing, speech, mandibular movements, and even respiration [3].

Cantor & Curtis provided a hemimandibulectomy classification for edentulous patient that can also be applied in partially edentulous arches (Table 1) [4]. In cases with class II, III, IV, and V guide flange prosthesis would be a treatment modality. For guide flange prosthesis to be effective sufficient number of posterior teeth that are periodontally sound should be present in the opposite arch.

In patients where reconstruction is not done after resection of the mandible, scar tissue formation occurs over a period of time that stiffens the tissues and worsens prosthetic rehabilitation leading to compromised treatment planning. In the present case after resection, reconstruction was not done so the amount of deviation was great. Also the patient was partially edentulous in the maxillary arch representing Kennedy's class I and sufficient number of teeth were not present in the mandibular arch. So the fabrication of guide flange prosthesis was not possible.

This article highlights Prosthetic rehabilitation of a hemimandibulectomy patient for whom a mandibular guide flange prosthesis or palatal ramp prosthesis cannot be fabricated.

Case Report

A 58 year old male patient reported to the Department of Prosthodontics with a chief complaint of difficulty in mastication since 2 months. His medical history revealed

S. Agarwal · Praveen G (✉) · S. K. Agarwal · S. Sharma
Department of Prosthodontics, Kothiwal Dental College and
Research Centre, Moradabad, UP 244001, India
e-mail: praveenmids@yahoo.co.in

Table 1 Cantor & Curtis (1971) hemimandibulectomy classification [4]

	Class I	Mandibular resection involving alveolar defect with preservation of mandibular continuity.
	Class II	Resection defects involve loss of mandibular continuity distal to the canine area.
	Class III	Resection defect involves loss up to the mandibular midline region.
	Class IV	Resection defect involves the lateral aspect of the mandible, but are augmented to maintain pseudoarticulation of bone and soft tissues in the region of the ascending ramus.
	Class V	Resection defect involves the symphysis and parasymphysis region only, augmented to preserve bilateral temporomandibular articulations.
	Class VI	Similar to class V, except that the mandibular continuity is not restored.



Fig. 1 Preoperative frontal view



Fig. 2 Preoperative lateral view

that he was diagnosed for squamous cell carcinoma on the left side of the mandible, for which he had undergone extensive resection of the entire mandible on left side with part of the anterior mandible on right side 6 years back. The patient’s habit revealed that he was a tobacco chewer, 10–15 packets per day for 40 years. An extra oral examination showed asymmetrical face, and a convex profile (Figs. 1, 2). There was deviation of the mandible to the left side that is towards the resected side. Patient’s dental history revealed that he was wearing a fixed partial denture in the maxillary posterior right arch that had been removed along with abutments due to mobility 2 months back.

On palpation the mandibular ridge was present till first premolar region. On evaluation of ortho-pantomogram (Fig. 3) revealed absence of the mandible mesial to the right first premolar involving the entire mandible of the left side. This particular case fails to represent any of the Cantor & Curtis classification. On intraoral examination it was found that the maxillary arch was partially edentulous, representing Kennedy’s class I condition (Fig. 4). Teeth present in maxilla were 11,12, 13,14,21,22, and 24. In the mandibular arch a four unit fixed partial denture with abutments as 44 and 47 was present. After extraction of the maxillary posterior fixed partial denture of the right side with abutments there was no intercuspation and there was more deviation of the mandible towards the resected side.



Fig. 3 Maxillary arch representing Kennedy's class 1 condition

Clinical Procedure

Preliminary impressions were made with irreversible hydrocolloid material (Zelgan2002, Dentsply, Gurgoan, India) using stock trays and casts were poured with type III dental stone (Kalabhai Pvt Ltd, New Delhi, India). On the maxillary cast a custom tray was fabricated with self-cure acrylic resin (RR, Dentsply, India) and border molding was performed. Final impression was made with zinc oxide eugenol impression paste (DPI, Mumbai, India). Alginate tray adhesive (Fix Adhesive, Dentsply, USA) was applied to custom tray and a pick up impression was made with stock tray. Impressions were poured with type III dental stone to obtain a master cast. Denture base was fabricated and wax occlusal rim was made. Maxillary master cast was articulated using a face bow (Hanau USA) on a semi adjustable articulator (Hanau Wide view, USA). Maxillo-mandibular relations were recorded with wax interocclusal records [5]. The patient's tactile sense or sense of comfort was used to assess the vertical dimension of occlusion. The patient was advised to move his mandible as far as possible to the untreated side and then gently close his mandibular jaw into position to record a functional maxillomandibular relationship (Fig. 5). After articulation, two sets of anatomic teeth (Premadent, New Delhi, India) were selected. Two rows of teeth were arranged for the posterior region of edentulous maxilla on the unaffected side (Fig. 6).

First row of teeth were arranged as per contour of the patients ridge and the other set were arranged palatal to the first row on the unaffected side in the maxillary arch (Fig. 7) on which the mandibular teeth will occlude. Occlusal surfaces of these teeth were ground so as to obtain intimate contact with the opposite tooth and to provide freedom of movement in the lateral direction. Arrangement was verified during try in and denture processed, finished and polished.

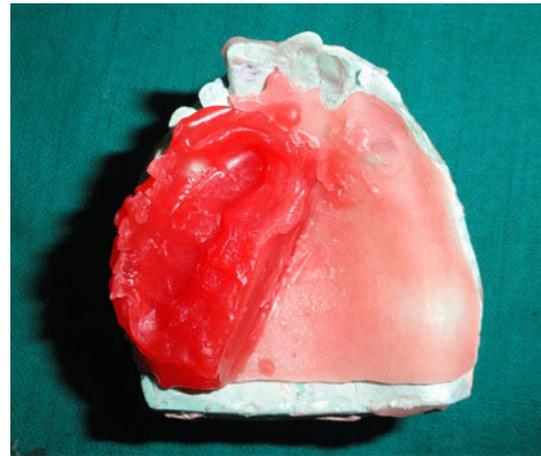


Fig. 4 Bite record



Fig. 5 Orthopantomogram revealing resection of the mandible of left side



Fig. 6 Intercuspation obtained by twin occlusion on the nonresected side

Discussion

This article highlights functional rehabilitation of hemimandibulectomy patient who has undergone resection without reconstruction. Literature review advocates fabrication of guide flange or palatal ramp prosthesis for such patients to prevent deviation of the mandible and to

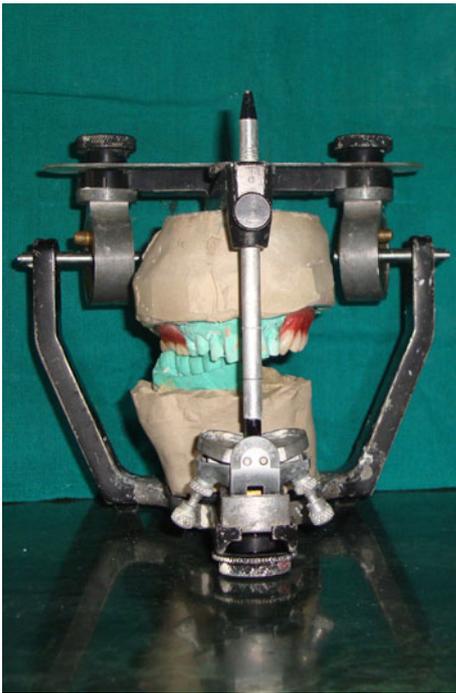


Fig. 7 Mounted casts on articulator with arrangement of teeth

improve masticatory function and aesthetics. Since a considerable period of time had elapsed after the surgical procedure, scar tissue formation has occurred and guidance prosthesis was not possible. Apart from this, guide flange therapy is most successful in patients where resection involves only bony structures with minimal sacrifice of tongue, floor of the mouth, and adjacent soft tissue [1, 6]. Hence we fabricated a conventional maxillary removable partial prosthesis with two rows of teeth—twinned occlusion [5, 7]. Two rows of teeth were arranged because the patient could not close in proper intercuspation and hence could not masticate. The palatal row of teeth intercuspated with the remaining mandibular teeth and the buccal row of teeth supported the cheeks. After insertion of the prosthesis the patient could intercuspate mandibular teeth properly (Fig. 8) due to twin maxillary occlusal table. The patient was kept on 6 months recall. After 1 week the patient reported an increase in masticatory efficiency and seemed happy with the treatment.

Conclusion

In patients with mandibular resection the prognosis of any prosthesis is guarded. This present article illustrates



Fig. 8 Occlusal view of definitive prosthesis placed in maxilla

functional rehabilitation of hemimandibulectomy patient, who had undergone resection without reconstruction. Guide flange prosthesis is the most common treatment modality in such cases but in cases where sufficient numbers of abutment teeth are not present and where deviation is massive, providing twin occlusion, rehabilitates the patient functionally. Improved mastication on the non-resected side with a removable prosthesis is a reasonable objective than expensive implant therapy.

References

1. Beumer J III, Curtis TA, Marunick MT (1996) Maxillofacial rehabilitation: prosthodontic and surgical consideration. Ishiyaku Euro America, St. Louis, pp 184–188
2. Shetty P, Baliga M, Rodrigues S, Dixit S (2009) Prosthetic management following mandibular resection: clinical report. *J Nepal Dent Assoc* 10(1):57–60
3. Buemer J, Curtis T, Firtell D (1979) Maxillofacial rehabilitation. Mosby, St. Louis, pp 90–169
4. Fonsica RJ, Davis WH (1986) Reconstruction preprosthetic oral and maxillofacial surgery, 2nd edn. WB Saunders Company, Philadelphia, pp 1063–1067
5. Charles CS (1969) Prosthetic management of resected edentulous mandibles. *J Prosthet Dent* 14:197–202
6. Sahin N, Hekimoglu C, Aslan Y (2005) The fabrication of cast metal guidance flange prosthesis for a patient with segmental mandibulectomy: a clinical report. *J Prosthet Dent* 93:217–220
7. Rosenthal LE (1964) The edentulous patient with jaw defects. *J Clin N Am* 8:773–779