Case report

Rehabilitation of Hemimandibulectomy Patient with Twin Occlusion and Mandibular Cusil Denture: A Case Report

Abstract:

Aim: To report a case of segmental resection of mandible and its prosthodontic management.

Case Report: Case Report of 48 year old male patient with extensive resection of the mandible from midline to area near 2nd molar with angle of ramus intact has been presented

Discussion: Segmental resection of the mandible commonly results in the deviation of mandible toward the defective side. The amount of deviation depends on the amount of hard and soft tissue involvement, method of surgical site closure, degree of impaired tongue function, number of remaining teeth and the extent of loss of sensory and motor innervations. Prosthodontic treatment along with physical therapy may be useful in reducing mandibular deviation and improving masticatory efficiency. Cu-Sil denture is a simplified approach which helps in preserving the few remaining natural teeth. It is a new type of transitional denture which clasps the neck of the tooth providing space for the remaining teeth to emerge into the oral cavity through the denture.

Conclusion: Rehabilitation of an edentulous mandibulectomy patient with use of two rows of semianatomic teeth on the unresected side (twin occlusion) provides a broader occlusal table and improved masticatory efficiency. Also, a simple chair-side clinical approach to fabricate Cu-Sil denture maintains proprioception and provides psychological benefit for the patient.

Keywords: Double rows of teeth, hemi-mandibulectomy, prosthetic rehabilitation, Cu-Sil denture.

INTRODUCTION

One of the most challenging and demanding maxillofacial endeavors is the construction of functional, complete dentures for the edentulous patient who has undergone a mandibular resection. Disruption of mandible either because of trauma or surgical resection owing to benign, malignant neoplasm or osteoradionecrosis is common. The resection of mandible can be total or segmental with or without loss of continuity depending on the extension of the lesion [1]. Cantor & Curtis provided a hemimandibulectomy classification for edentulous patient that can also be applied in partially edentulous arches [2].

The most significant difficulty encountered is mandibular deviation towards the defective side and rotation inferiorly due to muscle pull and scar contracture affecting mandibular movements, mastication, speech and aesthetics The main treatment objective in hemimandibulectomy cases is to re-establish an acceptable occlusal relationship for the residual dentition which provides sufficient masticatory efficiency [3]. However, delay in the initiation of mandibular guidance therapy may occur owing to varied reasons like postsurgical morbidities, tight wound closure, radiation therapy, flap necrosis, and others, which may result in an inability to achieve normal maxillomandibular relationships. In such patients, scar tissue formation occurs over a period of time that stiffens the tissues and worsens prosthetic rehabilitation leading to compromised treatment planning [4].

This article describes the use of two rows of maxillary teeth on the unresected side in a patient who had undergone partial mandibulectomy and fabrication of mandibular cusil denture to rehabilitate mandibular arch.

CASE REPORT

A 48 year old male patient reported to the Department of Prosthodontics And Crown & Bridge, ITS Dental College, Muradnagar, Ghaziabad, with a chief complaint of difficulty in mastication since 3 years. The medical history revealed that he was diagnosed for squamous cell carcinoma 6 years back on the left side of the mandible, for which he had undergone extensive resection of the mandible from midline to area near 2nd molar keeping angle of ramus intact on left side. The patient's habit revealed that he was a tobacco chewer, 5-10 packets per day for 20 years. Extra-oral examination showed asymmetrical face (figure 1) with deviation of the mandible to the left side.

On palpation the mandibular ridge was present till first premolar area on the left side and then on the left side only a part ramus was present. The ortho-pantomogram revealed the absence of mandible on the left side from second premolar upto angle of ramus. This particular case failed to represent any of the Cantor & Curtis classification. On intra-oral examination, it was found that the maxillary arch was partially edentulous. Patient had removable partial denture in relation to 11 and 12. Teeth present in right side mandibular arch were 43, 44, 45 and 47 and on left mandibular arch were 32 and 33. Severe attrition was present on 43,44 and 45 teeth. Patient had reduced mouth opening up to 26 mm. The periodontal status of 47, 32 and 33 was poor, so decision was made to extract those teeth but patient was not willing to get them extracted.

Preliminary impressions were made with irreversible hydrocolloid material (Zelgan 2002, Dentsply, Gurgoan, India) using stock trays and casts were poured with type III dental stone (Kalabhai Pvt Ltd, New Delhi, India). Tentative jaw relation was recorded and cast were articulated. Interarch space was adequate and was planned for intentional root canal treatmentct in relation to 43,44 and 45, followed by porcelain fused metal ceramic restoration.

Tooth preparation was done in relation to 43,44 and 45 followed by cementation of the porcelain fused to metal crowns with Type 1 glass ionomer cement. 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. Lower arch impression was made with putty and light body polyvinylsiloxane impression material. Denture base was fabricated and wax occlusal rim was made. Maxillary master cast was articulated (figure 2). using a face bow (Hanau USA) on a semi-adjustable articulator (Hanau Wide view, USA) Maxillo-mandibular relations were recorded with wax interocclusal records. 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. After articulation, two sets of semi-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. 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 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 (figure 3). Arrangement was verified during try in and denture processed, finished and polished. Maxillary complete denture and mandibular fixed partial supported cusil denture placement was done (figure 4).

After insertion of the prosthesis the patient could intercuspate mandibular teeth properly due to twin maxillary occlusal table. After 1 week the patient reported an increase in masticatory efficiency and seemed happy with the treatment (figure 5).

DISCUSSION

This article highlights functional rehabilitation of hemimandibulectomy patient who has undergone resection without reconstruction. 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. Literature review advocates fabrication of guide flange or palatal ramp prosthesis for such patients to prevent deviation of the mandible and to 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 [5]. 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. Hence, the present case was rehabilitated with conventional maxillary removable partial prosthesis with two rows of teeth-twinned occlusion. 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 [6].

Cusil denture is a transitional denture which is found to be a simplified approach as well as an affordable treatment option for patients with few remaining natural teeth. It increases retention and stability of the prosthesis thereby improving the attitude of the patient as the natural teeth are preserved. Masticatory efficiency is also improved when compared to conventional complete denture patients as proprioception is preserved in such patients. This treatment modality does not require any special armamentarium or materials whereas if the tooth is lost in future denture can be modified to occupy its place. However, cusil dentures are associated with some disadvantages like plaque accumulation since the entire margin of the gingiva is covered by the denture [7]. The functional duration of soft liner used is short and need frequent corrections. Cusil dentures may be thus indicated in single or isolated teeth, mobile periodontallyinvolved teeth, need for transitional denture and to eliminate extractions. However it is contraindicated in case of multiple teeth, presence of anterior teeth, patients with open smile and severe undercuts. Nevertheless, cusil like dentures provide an elastic gasket that seals itself surrounding the cervical part of every tooth, thereby providing a stable and healthy fit. It promotes healthy stimulation to maintain alveolar bone.Retention is improved, attachment devices are avoided, and vertical dimension and proprioception are maintained [7,8].

CONCLUSION

Certain basic principles of construction of conventional dentures should be modified for mandibular resection patients because of many restrictive physical factors. The present article highlights a simplified approach for managing hemimandibulectomy patient. A broad occlusal table developed in the maxillary arch on the unaffected side helps to position the residual

fragment into the correct sagittal relationship, therby enhancing the stability of the dentures alongwith improved masticatory ability. Cusil like dentures rest on the soft tissues and offer a comfortable fit over existing, healthy tooth structures. Improved mastication on the nonresected side with a removable prosthesis is a reasonable objective than expensive implant therapy.

REFERENCES

1. Datta P, Talukder D, Datta SS. Twin Occlusion Prosthesis: Management of Hemimandibulectomy Patient: A Case Report. Indian J Dent Educ. 2018;11(3):73–6.
2. Cantor R, Curtis TA. Prosthetic management of edentulous mandibulectomy patients: Part I. Anatomic, physiologic, and psychologic considerations. J Prosthet Dent 1971:446–573.
3. Beumer J III, Curtis TA, Marunick MT (1996) Maxillofacial rehabilitation: prosthodontic and surgical consideration. Ishiyaku Euro America, St. Louis, pp 184–188.
4. Sharma R, Sharma A, Verma B, Singh S, Singh S. Twin-occlusion prosthesis: A glimmer of hope for hemimandibulectomy patient. Indian J Dent Sci. 2019;11(1):61.
5. Agarwal S, Praveen G, Agarwal SK, Sharma S. Twin occlusion: A solution to rehabilitate hemimandibulectomy patient - A case report. J Indian Prosthodont Soc. 2011;11(4):254–7.
6. Chahar PK, Sarkar A, Gowda EM, Prakash P, Kumar VR, Awasthi P. Rehabilitation of Hemi-Mandibulectomy Patient with Twin Occlusion Prosthesis. Int J Contem Med Sur Rad. 2019;4(1):A24-A26.
7. Savitha K, Manoharan PS, Rajkumar E, Balaji J. FPD Supported Cu-Sil Like Denture - A Simplified Approach to Preserve the Teeth and Bone. Int J Heal Sci Res. 2021;11(6):130–4.
8. Vinayagavel, Sabarigrinathan, Gunasekar, Hema. Cusil like Denture - Case Report.Int J

Health Sci Res. 2014;4(2):194-197.

Figure 1: Preoperative view

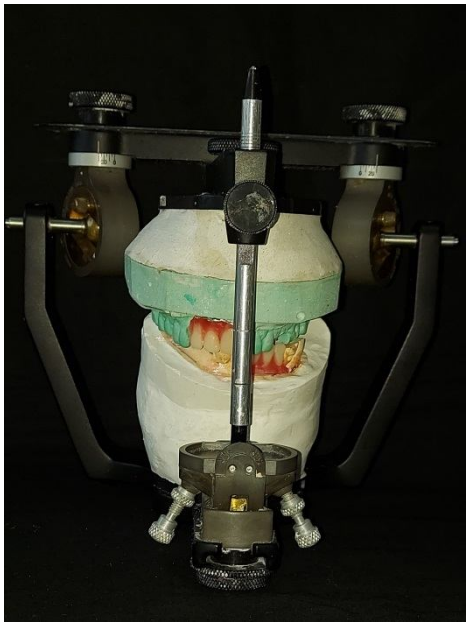

Figure 2: Articulated casts with teeth arrangement

Figure 3: Maxillary twin occlusion denture

Figure 4: Mandibular cusil like denture

Figure 5: Post-operative View