Case report

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

Abstract:

Segmental resection surgery of the mandible results in the deviation of mandible toward the defect side. The amount of deviation is determined by the quantity of hard and soft tissue resection, the type of surgical site closure, the degree of tongue function impairment, the number of remaining teeth present, and the extent of sensory and motor innervation damage. Mandibular deviation may be reduced with improved masticatory function with prosthodontic treatment combined with physical therapy. Cu-Sil denture is a easy approach which helps in conserving the few remaining natural teeth. It is a type of transitional denture that clasps the neck of the tooth and provides space for the remaining teeth to emerge into the oral cavity through the denture. Preserving the remaining teeth preserves the alveolar ridge and also maintains proprioception that provides psychological benefit for the patient. The present clinical report describes the usage of additional rows of semi-anatomic teeth on the unresected side. This gives a broader occlusal table with improved masticatory efficiency in an edentulous mandibulectomy patient and provides a simple chair-side clinical approach to construct Cu-Sil denture by preserving the few natural teeth.

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

INTRODUCTION

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

"The major difficulty encountered is mandibular deviation towards the defective side and rotation inferiorly. This is due to muscle pull and scar contracture which affects 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 introduction of mandibular guidance therapy may occur due to various 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 double rows of maxillary teeth on the unresected side in a patient who had gone through partial mandibulectomy and fabrication of mandibular cusil denture for rehabilitating mandibular arch.

CASE REPORT

A 48 years old male patient reported to the Department of Prosthodontics And Crown & Bridge, ITS Dental College, Muradnagar, with a chief complaint of trouble in mastication since 5 years. The medical history showed that he was diagnosed squamous cell carcinoma 6 years ago on the left side of the mandible, due to which he had undergone extensive resection of the left side of the mandible from first premolar to area near 2nd molar leaving angle of ramus intact. The patient was a tobacco chewer, used to consumed 5-10 packets per day for 26 years. Extra-oral examination showed asymmetrical face (figure 1) with mandible deviation to the left side.

During palpating the left side mandibular ridge it was found that ridge is present till first premolar area and only a part ramus was present. The ortho-pantomogram showed the absence of mandible on the left side from second premolar upto angle of ramus. Intra-oral examination showed partially edentulous maxillary arch. 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, and the decision was made to extract those teeth but patient was not willing to get them extracted.

Preliminary impressions were made using stock trays with irreversible hydrocolloid material (Zelgan, Dentsply, India) after that casts were poured with type III dental stone. Cast were articulated after tentative jaw relation was recorded. Interarch space was sufficient and

intentional root canal treatment was planned in relation to 43,44 and 45, followed by porcelain fused metal restoration.

Tooth preparations were done in relation to 43,44 and 45. Cementation of the porcelain fused to metal crowns was done with Type 1 glass ionomer cement. A custom tray was fabricated on the maxillary cast with self-cure acrylic resin material (RR, Dentsply, India) and mandibular border molding was done. Final impression was made by zinc oxide eugenol impression paste. Tray adhesive (Fix Adhesive, Dentsply, USA) for alginate impression was applied on the custom tray and a pick up impression was made using stock tray. Impression was poured with type III dental stone and master cast was obtained. Lower arch impression was made with putty and light body polyvinylsiloxane impression material. Denture base was made-up and modeling wax occlusal rim was made over that. After taking face bow record maxillary master cast was articulated (figure 2) on a semi-adjustable articulator (Hanau Wide view, USA). Maxillo-mandibular relations were recorded using wax interocclusal records. Vertical dimension of occlusion was assessed by patient's tactile sense or sense of comfort. The patient was asked to move his mandible as much as possible to the unresected side and then softly close his lower jaw into position to track a functional maxillomandibular relationship. After articulationwas done, semi-anatomic teeth were chosen. Second row of teeth were arranged on the posterior region of maxilla on the unresected side. First row of teeth were the patient's own natural teeth and the semi-anatomic teeth were arranged palatal to the natural posterior teeth on the nonresected side in the maxillary arch onto which the mandibular teeth will occlude. Occlusal surfaces of these teeth were reduced so that intimate contact with the opposite tooth was obtained and to offer freedom of movement in the lateral direction (figure 3). Teeth arrangement was done and verified during try in after that denture was processed, finished and polished. Maxillary clasp

retained twin occlusion table denture and mandibular cusil denture placement was done (figure 4).

After prosthesis insertion patient could intercuspate mandibular teeth properly to the maxillay teeth due to twin maxillary occlusal table. After a week, the patient stated an inprove in masticatory efficiency and was happy with the treatment (figure 5).

DISCUSSION

"This present article explains functional rehabilitation of hemimandibulectomy patient who has underwent resection without any reconstruction, because reconstruction was not done after resection, the amount of deviation was too much. Also sufficient number of teeth were not present in the mandibular arch, so guide flange prosthesis fabrication was not possible. Literature review supports fabrication of palatal ramp or guide flange prosthesis for hemimandiblectomy patients to prevent deviation of the mandible and to enhance masticatory function and aesthetics. Since a considerable period of time had elapsed after the surgical procedure, scar tissue formation had occurred and guidance prosthesis was not possible" [5]. "Other then this, guide flange therapy is successful in patients when resection contains only bony structures with minimal loss of tongue, floor of the mouth, and neighboring soft tissue. Hence, in the present case rehabilitation was done with conventional maxillary removable prosthesis with additional row of teeth-twinned occlusion. Additional row of teeth were arranged because the patient was not able to close in proper intercuspation and was not able to masticate. The palatal row of teeth intercuspated with the remaining mandibular teeth" [6].

"Cusil denture has been simplified approach as well as an inexpensive treatment option for

patients with few natural teeth present in oral cavity. It increases retention and stability of the given prosthesis and improves the viewpoint of the patient as the natural teeth are conserved. Masticatory efficiency is improved as compared to conventional complete denture patients because proprioception is preserved in such patients. 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 function of soft liner used is for short duration hence need frequent corrections. Cusil dentures indicated in single or isolated teeth, mobile and periodontally involved teeth, need for the transitional denture and to exclude extractions. However, it is contraindicated if multiple teeth are present, presence of anterior teeth, patients having open smile and if severe undercuts are present. "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

Due to several physical limitations, the fundamental principles of conventional denture fabrication must be altered for patients who have had a mandibular resection. The present article highlights a simplified approach for managing hemimandibulectomy patient. A widened occlusal table in the maxillary arch on the non defect side helps to place the residual fragment into the appropriate sagittal relationship, therby improving the stability of the dentures alongwith enhanced masticatory ability. Cusil like dentures take support from the soft tissues and provide a comfy fit over existing, tooth structures. A removable prosthesis that improves mastication on the nonresected side is a more feasible goal than costly implant treatment.

Consent and Ethical Approval

As per international standard or university standard, patients' written consent and ethical approval has been collected and preserved by the author(s).

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Figure 1: Preoperative view

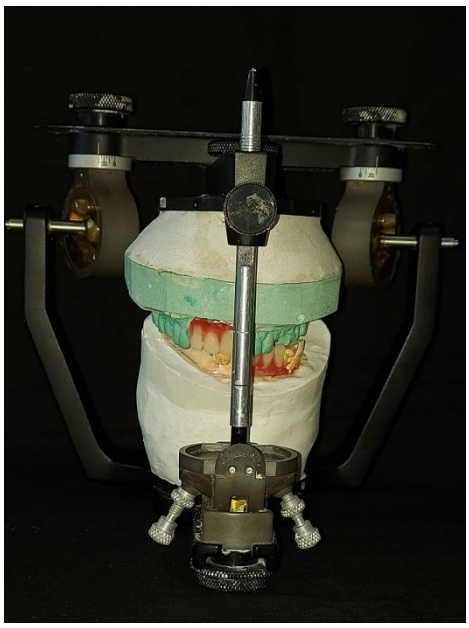

Figure 2: Articulated casts with teeth arrangement

Figure 3: Maxillary twin occlusion denture

Figure 4: Mandibular cusil like denture

Figure 5: Post-operative View