



PROSTHETIC MANAGEMENT IN MARGINAL MANDIBULECTOMY PATIENTS:A CASE REPORT

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ABSTRACT

Prosthetic management of surgical intra-oral defect is a big challenge for a restoring prosthodontist. Marginal Mandibulectomy patient presents with many problems because of deviation of mandible on affected side. This incapacitation depends upon the amount of hard and soft tissue resected, remaining dentition and tongue mobility for mastication and other oral functions. It is essential to restore the oral functions in such patients to ensure for an ability to have healthy diet and overall general health. The treatment options for such patients are surgical reconstruction of resected part, physiotherapy or prosthodontic intervention. This case report describes the fabrication of a unique design of removable cast partial denture for a patient with marginal mandibulectomy in anterior edentulous area.

KEYWORDS : Marginal mandibulectomy, Odontogenic tumour, Removable cast partial denture, Mastication, speech.

INTRODUCTION

Surgical treatment for malignant tumours of the oral cavity often requires resection of mandible, floor of the mouth, tongue and also the palate.^[1,2] Loss of mandibular continuity after surgical treatment leads to altered muscle function and deviation of residual fragment towards the surgical side.^[3] Loss of continuity of the mandible affects balance of the mandibular movement and function, leading to altered mandibular movement and deviation of the residual fragment towards the surgical side.^[3,4]

Apart from the deviation of mandible to resected side, other dysfunctions observed are difficulty in mastication, swallowing, speech, mandibular movements and even respiration.^[5] Managing marginal mandibulectomy patient is difficult. Moreover, in this case existence of long edentulous span makes the situation all the more challenging. Cantor and Curtis provided a hemi-mandibulectomy classification for edentulous patient that can also be applied in partially edentulous arches^[6]. In cases with class II, III, IV and V guide flange prosthesis would be a treatment modality.^[5]

This case report describes prosthodontic management of a patient with marginal mandibulectomy in anterior edentulous area and was rehabilitated by a uniquely designed a removable cast partial denture, which fulfil the patients need and requirements.

CASE REPORT

A 68 year old, female patient was referred to the Department of Prosthodontics. She reported with the chief complaint of difficulty in speaking and chewing food due to missing teeth, and wanted replacement of teeth. The patient gave a history of erica nut chewing since 25years, 8-10 times/day. The patient was diagnosed with carcinoma involving labial mucosa and mandibular alveolus and thus anterior region marginal mandibulectomy was performed 6 months ago. Radiation therapy was completed a month before. Extra-oral examination revealed decreased mouth opening, facial asymmetry. Intraoral examination revealed anterior mandibular defect with 44,45,46,47 present and generalised abrasions seen. Firstly, scaling polishing was done and 37 was extracted due to mobility and composite filling done with remaining teeth.[Figure.1] Both the ridges were smooth, round with well keratinized mucosa with sufficient height and width for support. Radiographic

examination revealed the absence of alveolus in the anterior mandibular region.[Figure.2] The case was diagnosed as cantor and Curtis class V mandibular defect.^[7] Treatment plan meticulously designed and formulated for this challenging situation was mandibular cast partial denture framework.

Procedure:

Mandibular and maxillary preliminary impressions were made using irreversible hydrocolloid material using stock trays. Impressions were poured with type IV dental stone. Casts were prepared. A metal framework for the mandible was cast [Figure.3,4] tried in the patient's mouth[Figure.5] and the required adjustments were done. The framework with the mouth temperature wax rolled on its edentulous portion and was placed into mouth. The functional movements made by the patient were recorded in the impression. After setting, the material was trimmed down by 2 mm. The green modeling plastic impression compound (Kerr) was softened and loaded. Still, functional movements were made in the same manner by the patient. A final functional impression was corrected using zinc oxide eugenol impression material.

Artificial teeth were arranged in the edentulous region. The trial dentures were inserted into the mouth. Arrangement was verified during try-in. After deciding that the trial dentures were stable and retentive, intercuspal relation was checked and thereafter esthetic, phonetic and functional requirements were fulfilled. After processing, finishing and polishing, the denture was delivered to the patient and tested for stability, retention, intercuspal relation, esthetics and phonetics. In this way patient was rehabilitated with prosthesis.[Figure. 6] The patient was given post insertion instructions and was motivated to make efforts to learn to adapt to the new dentures.

After insertion of denture, patient reported an increase in masticatory efficiency and happy with the treatment. The patient was kept on 6 months recall.

Designing of metal framework:

In this case, patient has unilateral posterior teeth and an extensive edentulous area. Which is a Kennedy's class II situation. In this case, it is very difficult to achieve retention, stability & support because of

long edentulous span and very few natural teeth were present and patient has undergone marginal Mandibulectomy. So, a planned removable cast partial denture framework was considered to be the treatment of choice; which included multiple rests, guide and proximal plates and additional bracing with lingual plating.

1. Additional bracing with lingual plating: To distribute lateral forces as widely as possible among the remaining dentition, helps in cross arch stabilization, provides stability, act as indirect retainer and it serves the purpose of major connector.[Figure. 7]
2. Ribbon rests: To idealize the occlusal plane and restore occlusal contacts. It also provides support.[Figure. 8]
3. Direct retainer: This design provides additional bracing in the horizontal plane. The retentive arm approaching gingivally and the retentive tip engage the middle of cervical one third of the 2nd molar.
4. Direct retainer (I-bar): I bar on the teeth adjacent to the anterior edentulous area positioned so that it engages into the distal undercut, it helps in improving esthetics of the patient.[Figure. 9]

With the help of such kind of uniquely designed metal framework we have achieved retention, stability and support to the maximum extent.

DISCUSSION

According to Olson ML et al [8] in 1978 and Curtis DA et al [9] in 1997, resected part of mandible should be immediately reconstructed to recover both facial symmetry and masticatory function.

The soft tissues that form the internal and external surfaces of the denture greatly affect and influence the stability of the dentures, and helps in determining the peripheral borders, tooth position, and external contours of the dentures. The forces developed through muscular contraction during mastication, speaking and swallowing are directed against the dentures. This will help either stabilizing them or tend to dislodge them. Masticatory force plays a prime role in stabilising any prosthesis. Masticatory force is dependent upon the integrity of the muscles of mastication, tempero-mandibular joint (TMJ), mandible, dentition, and the status of surrounding hard and soft tissues. All may be affected by radiation therapy and surgery, two of the modalities used to treat head and neck neoplasms.^[10,11] Trismus, xerostomia, edema, mucositis and radiation caries have been documented as side effects of radiation therapy.^[12,13] Most long term alterations can be attributed to changes in tissue vascularity within the radiation field.

Techniques designed to define the neutral zone for the purpose of tooth location may help provide increase stability, any denture must have enough retention to resist the momentary displacing forces caused by imbalanced muscle action. Neutral zone is the area in the mouth where the forces of the tongue pressing outward are neutralized by the forces of cheeks and lips pressing inward during function. The perioral musculature, especially the buccinators muscle is the outer limit of the neutral zone. The length, strength and position of this muscle are the main determinants. Another important muscle is orbicularis oris muscle. Removable partial dentures fabricated according to the neutral zone technique for mandibulectomy patients with anterior edentulous areas are believed to enhance esthetics and provide support for the lower lip and cheek. It will frequently lead to improved articulation of speech and enhance the control of saliva. In the case hereby reported, mastication, speech, esthetics, saliva control and facial profile were considerably enhanced. These results indicate that the application of neutral zone concept for the patients who undergo maxillectomy or mandibulectomy may help stability of the denture base, and also improve functions. Accordingly, conventional removable partial dentures for marginal mandibulectomy patients with unusual soft tissue configurations that are constructed using the neutral zone impression technique are able to provide stability, esthetics and comfort. The neutral zone may be altered by orthodontics, elimination of noxious habits, myofunctional therapy, reduction of

tongue size, surgical lengthening of the buccinator band, vestibuloplasty and orthognathic surgery. However, it must be emphasized that the effect of surgical approach should be evaluated.

FIGURES:

Fig. 1- Intraoral frontal view



Fig. 2- Pre-treatment Orthopantomogram



Fig. 3- Cast partial denture framework



Fig. 4- Cast partial denture framework



Fig. 5- Try-in of metal framework



Fig. 6- Removable Cast Partial Denture



Fig. 7- Additional bracing with lingual plating

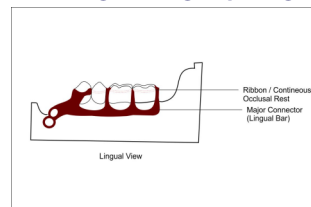
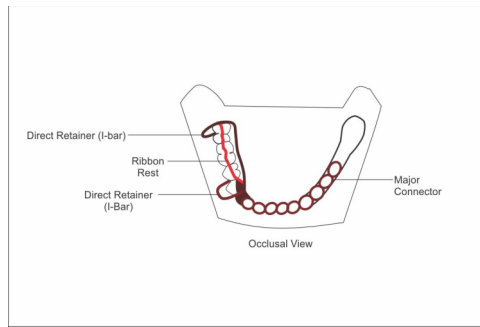
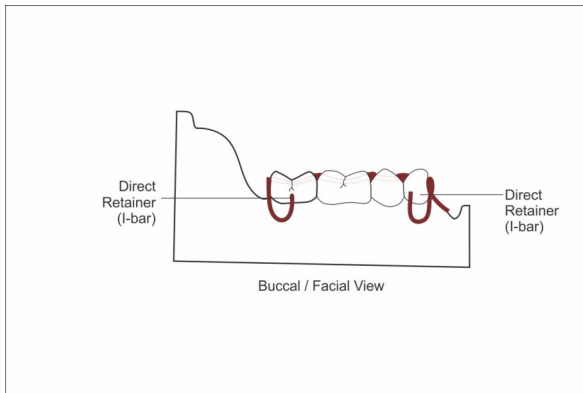


Fig.8-Ribbon rest**Fig.9-Direct retainer(I-bar)****REFERENCES**

1. Beumer J, Marunick MT, Curtis TA, Roumanas E. Acquired defects of the mandible. In: Bemer J(ed). Maxillofacial Rehabilitation: Prosthodontic and Surgical Consideration, 1st edition St. Louis. Euro America, 1996;201.
2. Jacob RF, Prosthodontic rehabilitation of the mandibulectomy patient. In, Taylor TD(ed). Clinical Maxillofacial Prosthetics, 1st edition. Illinois. Quintessence Publishing, 1997;171-172.
3. Shetty P, Baliga M, Rodrigues S, Dixit S. Prosthetic management following mandibular resection: clinical report. J Nepal Dent Assoc 2009;10:57-60.
4. Beumer J III, Curtis T, Marunick MT (1996) Maxillofacial rehabilitation: prosthodontic and surgical consideration. Ishiyaku Euro America, St. Louis, pp184-188
5. Beumer J, Curtis T, Firtell D. Maxillofacial Rehabilitation. St. Louis: Mosby; 1979. p. 90-169.
6. Fonsica RJ, Davis WH (1986) Reconstruction preprosthetic oral and maxillofacial surgery, 2nd edn. WB Saunders Company, Philadelphia, pp 1063-1067
7. Cantor R, Curtis TA. Prosthetic management of edentulous mandibulectomy patients: Part II, Clinical procedures. J Prosthet Dent 1971;25:546-555.
8. Olson ML, Shedd DP. Disability and rehabilitation in head and neck cancer patients after treatment. Head Neck Surg 1978;1:52-58.
9. Curtis DA, Plesh O, Miller AJ, Curtis TA, Sharma A, Schweitzer R, Hilsinger RL, Schour L, Singer M. A comparison of masticatory function in patients with or without reconstruction of the mandible. Head Neck 1997;19:287-296.
10. Beumer J, Curtis T, Harrison RE. Radiation therapy of the oral cavity: sequelae and management. Part I. Head Neck Surg 1979;1:301-12.
11. Kirkegaard J, Lindelov B, Bretlau P. Traditional and new treatment strategies for oral squamous cell carcinomas. Ear Nose Throat J 1989;68:593-604.
12. Driezen S, Dly TE, Drane JB, Brown LR. Oral complications of cancer radiotherapy. Postgrad Med 1977;61:85-92
13. Engelmeier RL, King GE. Complications of head and neck radiation therapy and their management. J prosthet Dent 1983;49:514-22