



Prosthetic management of hemimandibulectomy patient –A Case Report

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Introduction

The prosthodontic rehabilitation of patients with mandibular defects is challenging. The unilateral loss of mandibular continuity due to surgery or trauma results in mandibular deviation toward the defect side with lack of occlusion. Unlike the dentulous patients, edentulous patients are difficult to restrain mandibular movement and many times may never achieve proper maxillomandibular relationships for optimum mastication and appearance. We present a case of a completely edentulous hemimandibulectomy patient who approached for replacement of missing teeth after 6 years of cancer therapy. Initial evaluation of considering prosthetic management indicated poor prognosis. However, the patient's positive mental attitude toward treatment along with the application of basic fundamental principles by the prosthodontist during treatment procedure led us to fabricate a simple, effective functioning prosthesis that showed positive satisfactory prosthetic results.

Case Report

A 65-year-old male patient with maxillary and mandibular edentulous reported with the complaint of having difficulty in eating and speaking due to loss of teeth. The patient gave The medical history revealed that the patient was

surgically operated 6 years back by a wide resection of the tumor with left hemimandibulectomy without disarticulation, left radical neck dissection and reconstruction with pectoralis major myocutaneous flap. Extraoral examination indicated facial asymmetry and a convex profile with deviation of mandible to the left side. Clinical examination of the surgical wound closure showed consolidated cicatricial tissues

The surgical and implant reconstruction of the defect were suggested as choice of treatment; however, the patient refused any further surgical intervention due to poor socioeconomic status. The treatment was planned for fabricating maxillary and mandibular acrylic complete denture using dynamic functional impression technique and using neutral zone

Procedure

The preliminary impressions were made with irreversible hydrocolloid for the maxillary and mandibular arch and custom tray are fabricated for border molding. mandibular custom tray is fabricated using impression compound as vertical stops (to prevent the dislodgement of tray while impression making), which help in making the dynamic functional impression in the defected area. The self-cure acrylic resin denture base with

wax occlusal rims constructed on master casts was used to record jaw relation. The articulation was done on a semi adjustable articulator followed by recording the neutral zone using tissue conditioning material (Visco gel) by functional method. A putty index was made surrounding the neutral zone. The tissue conditioner was then replaced with modeling wax for arrangement of mandibular and maxillary nonanatomic acrylic teeth in the neutral zone area. Tryin was completed with a wax ramp made on the right palatal half surface adjacent to the posterior teeth that guided the deviated mandible into occlusion. After processing, finished and polished heat cure acrylic maxillary and mandibular acrylic prosthesis were inserted. Postinsertion, the patient, was advised not to masticate on the side of the defect. The patient was first trained with the guided prosthesis after its insertion to get accustomed. Follow-up evaluation every 3-6 months showed functional and psychological patient satisfaction



Custom tray with vertical stops to hold the tray



Functional impression using irreversible hydrocolloid



Hemimandibulectomy- rt. side



Mandibular final impression



Primary impression using irreversible hydrocolloid



Try-in denture using monoplane teeth(Rt. Side occlusion)



Try-in denture using monoplanes teeth(Lt. Side occlusion)



Discussion

The reasons for segmented resected mandible are multifactorial with several collateral problems which alter prosthetic prognosis. However, the four significant factors that affect the amount of prosthetic rehabilitation include the site and extent of surgery, the effect of radiation, presence or absence of teeth and psychological impact. The basic objective of rehabilitation is retraining the remaining mandibular muscles to stabilize the mandibular denture by providing an acceptable maxilla-mandibular relationship of the remaining portion of the mandible with repeated occlusal approximation in restoring occlusal function. Many patients need the additional support of a maxillary inclined plane prosthesis to assist muscle retraining that acts as guiding or training device. The retraining of the residual mandibular muscles would permit occlusion of remaining natural teeth or control of residual edentulous segments to provide for the reasonable placement and acceptable occlusion of the artificial teeth.

When surgical reconstruction following mandibulectomy is not feasible, various prosthesis are used to reduce or eliminate mandibular deviation. The tissue in the surgical region is scarred, uneven, unsupported by bone and movable in various degrees. These features make the area unsuitable to be covered by an appliance or to receive loading. The patients tolerated these simple uncomplicated prosthesis well and adapted very easily to guide the mandible to functional approximation. Its ease of use helps patients in retraining the muscles and learning to masticate with the prosthesis after a short period of accommodation. The discontinuity defect involves the problem of either accepting the postsurgical mandibular position or attempting to retrain the mandibular muscles to control the mediolateral position of the mandible to achieve an acceptable occlusal interdigitation. In either situations, opposing occluding surfaces of some type can be provided. But occlusal efficiency and limitations in prosthodontic management must be considered. In the present case, acrylic teeth with flat

occlusals were provided limiting occlusal efficiency.

During mastication, entire envelope of motion occurs on surgical defect side. The frontal plane rotation occurs due to loss of proprioceptive sense of occlusion, which leads to uncoordinated and less precise movement of the mandible. Also, due to attachment loss of muscles of mastication on surgical side, there is significant rotation of the mandible upon forceful closure. When the force of closure increases, the residual mandible actually rotates through the frontal plane. The primary cause for abnormal position of the mandible may be due to the action of suprahyoid muscle and uncompensated influence of contralateral internal pterygoid muscle.

In discontinuity defects, not only there is a loss of bone support, but surgical closure prevents the residual structures from being used for prosthesis support and extension. To improve stability and retention, neutral zone need to be recorded. In the present case, tissue conditioner was used as a functional impression to improve tissue bearing surface of the mandibular denture. The functional impression technique was advocated because the dynamic adaptive stress promotes a condition and a contour of the denture base mucosa that is compatible with denture function.

The mandibulectomy patient is difficult to manage because the prosthodontist is limited in his ability to provide a reasonable and practical occlusal scheme. However, these patients need the definitive clinical and psychological support of the prosthodontist. The timing of the maxillofacial prosthodontist's initial contact with these patients before surgery is very important for proper examination, planning and execution so that the training prosthesis can be inserted at the time of surgery or shortly later to prevent muscle imbalance from pulling the mandible to an eccentric position and decrease the effect of pull from the contraction of the cicatricial tissue.

Conclusion

The need for early consultation with the maxillofacial prosthodontist has been emphasized in rehabilitation of mandibulectomy patients. A multidisciplinary team approach before, during and after surgery for better prosthodontic treatment outcome is important along with early guidance therapy, individualized physiotherapy and patient cooperation. The positive mental attitude of the patient towards the treatment with assisted physiotherapy led to overcoming the limitations of prosthetic rehabilitation giving satisfactory results.

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