CASE REPORT

PROSTHETIC MANAGEMENT OF PARTIAL MANDIBULECTOMY PATIENT: A CASE REPORT

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ABSTRACT: Mandibulectomy and commando procedures involve the extensive loss of tissues and associated functions. Swallowing, speech, mandibular movements, mastication, control of saliva, respiration, and psychic functioning are adversely affected by radical mandibular surgery. The treatment of any maxillofacial patient is enhanced by careful preoperative evaluation. Clinical and radiographic examinations, including diagnostic casts, allow the prosthodontist to discuss the potential rehabilitative needs with the surgeon. The course of rehabilitation is associated with the location and extent of the lesion and the anticipated surgical management, and it is improved by early prosthodontic evaluation and treatment. Gross facial disfigurement and impaired mandibular function may result when the extent of surgery interrupts mandibular continuity. Maintaining continuity helps preserve normal muscle function and facial contours and leads to a more predictable and favorable prosthodontic treatment. The degree of success is related to the location and extent of the mandibular resection, the amount of adjacent soft tissue removed during surgery, and presence or absence of natural teeth. Retainers are probably the most important components contributing to the success of the prosthesis.

KEYWORDS: Malignant tumors, Marginal mandibulectomy, Design of cast partial denture, prosthetic rehabilitation.

INTRODUCTION: Malignant tumors of the mandible account for 0.5% of all deaths due to cancer. The different histologic tissues of mandible may contribute to malignant tumors.¹ The hard and soft tissue tumors of mandible usually require surgical removal of the lesion which results in extensive loss of tissues.² Swallowing, speech, mandibular movements, mastication, and control of saliva, respiration, and psychic functioning are adversely affected by radical mandibular surgery. These dysfunctions radically alter the prosthetic prognosis.³

The presence or absence of natural teeth in a resected mandible often determines the approach to prosthetic rehabilitation. Cantor and Curtis (1971) classified edentulous mandibular resection patients by the amount of mandible that remains after resection and surgical reconstruction.⁴

Marginal mandibulectomies involve resections of the mandibular body extend from the retromolar trigone to the contralateral retromolar trigone area or terminate anywhere in between, with overlying soft tissues while maintaining the inferior cortex of the mandible and its continuity. By maintaining the anatomy of muscle of mastication, mandibular movement is not disrupted.⁵

The treatment of any maxillofacial patient is enhanced by careful preoperative evaluation. The prosthodontist discuss the potential rehabilitative needs with the surgeon. The course of rehabilitation is associated with the location and extent of the lesion and the anticipated surgical management, and it is improved by early prosthodontic evaluation and treatment.⁶

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CASE REPORT: A 66 year old male patient was referred to the department of prosthodontics. He complains of missing teeth in anterior and posterior region. The patient's medical history revealed history of hypertension under treatment from last four to five years with Amlophy (once a day) medication. His dental history indicated that he had tobacco chewing habit four to five times a day since last 30 years. The tumor was detected eleven month back. Patient had to undergo surgical excision of the tumor eight months back. (Fig: 1)

The extraoral examination shows asymmetrical face with delicate feature, TMJ movements were normal with no deviation of mandible. Intraoral examination showed missing 41, 42, 43, 44, 45, 46 and 27, grade 1 mobility with 31 and 32, gingival recession with 31, 32, and 33. Stain ++, calculus +, A non scrapable white lesion was present on right labial mucosa extending from sulcus to vermilion border of lower lip (fig: 2). Radiographic examination showed resected mandible in 41, 42, 43, 44, 45 and 46 region.

Clinical procedure: All Preprosthetic procedures were carried out (fig: 3). Primary impressions were made with irreversible hydrocolloid using stock trays. Casts were prepared (fig: 4). Mandibular cast was surveyed using Jelenko surveyor. Cast partial denture design was planned by considering the basic principles of clasp design.^{7,8} Acrylic resin impression tray was constructed. Mouth preparation for cast partial denture was done (fig: 5). The tray was border- molded using green stick impression compound taking care to avoid overextension. Final impression was made with light body impression material (fig: 6).

Master cast was poured in die stone. This cast was again surveyed and wax pattern was made for fabrication of cast partial denture frame work (fig: 7).⁹

Design of cast partial denture

Direct retainer, embrasure clasp was placed in the embrasure of 37 and 36, 35 and 34 and cingulum rest on 33. Lingual plate major connector was waxed which extend from 31 to 33 and lingual bar major connector was waxed which was continuation of lingual plate and extend up to 37. A large open lattice was waxed in the mandibulectomy site. The lingual plate provided the advantage of splinting for mobile mandibular anterior teeth. Direct retainers were not placed on 47 and 48 because there was no bone on mesial root surface of 47 and tooth was lingually tilted.

Try in of fabricated metal framework was done (fig: 8). Wax rim were adjusted to record the vertical dimension (fig: 9). Face bow transfer was made to orient the maxillary cast to the semi-adjustable articulator (fig: 10). Mandibular cast was mounted in centric relation (fig: 11). The semi-anatomic teeth were arranged in the usual manner (fig: 12). Try in was done (fig: 13) and fabricated denture were inserted (fig: 14).

DISCUSSION: The treatment of a patient with cancer of the floor of the mouth may include surgery, radiation therapy, chemotherapy, or a combination of these modalities. The extent of surgery interrupts mandibular continuity and leads to facial disfigurement and mandibular function impairment but maintaining continuity helps preserve normal muscle function and facial contours and leads to better rehabilitation of prosthesis. When mandibular anterior teeth are surgically removed with a portion of the floor of the mouth and tongue, the facial muscles exert force on the remaining dentition, which may lead to a severe lingual inclination of the teeth.¹⁰

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The restoration of acceptable occlusal function of which is one of the primary goals of treatment is achieved by location and extent of the mandibular resection and the presence or absence of natural teeth. The number and health of the teeth must be considered in developing occlusal scheme. In large defect, few teeth are present which are subjected to large amount of stress. This stress is controlled by splinting of abutment teeth, proper prosthesis design and a functional occlusion.⁶ The teeth present in opposite arch are considered in planning an occlusal scheme. Deflective occlusal contacts in centric and eccentric positions add stress to the remaining teeth and residual alveolar ridges. The basic objective is to achieve an occlusal scheme which will have a multiplicity of occlusal contacts in centric position.⁶

The rehabilitation of anterior mandibular region is difficult due to the curvature of the mandible. The realignment of mandibular fragments in dentate patient is achieved by remaining dentition but this is still more difficult in edentulous patient.¹¹ The occlusal force, activated during mastication and swallowing, is reduced by occlusal rest and lateral forces is minimized by the proper selection of an occlusal scheme, elimination of premature occlusal contacts, and wide distribution of stabilizing components.⁸

Properly designed retainers reduce the stresses transmitted to the abutment teeth while retaining the prosthesis in place. It is essential that the basic principles of clasp design such as passive placement, retention, stabilization, encirclement, support and movement be followed.⁸

When the mandible is brought in centric relation, cast metal mandible prosthesis is used for the patient who lacks the motor skills to bring the mandible into occlusion. The patient is able to achieve the maximum intercuspal position when the teeth of both the arches are effectively guided and reprogrammed the mandibular movement. In most patients, reestablishment of reasonable masticatory efficiency is dependent upon good tongue mobility.¹²

The lingual bar acted as the major connector to unite the retentive units and provide resistance to dislodging forces. There may be several major connector designs that will satisfy the chief requirements for a major connector. The dentist should select the one which will least interfere with speaking, mastication, swallowing, and normal rest.¹³ Pressure-indicating paste, as well as response from the patient, can locate regions of soft tissue impingement. The pressure mark must be relieved by adjusting the acrylic resin.¹⁴

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Fig. 1: Preoperative frontal view

Fig. 2: Preoperative right and left lateral view

Fig. 3: Preposthetic work completed

Fig. 4: Diagnostic cast

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Fig. 5: Mouth preparation for cast partial denture framework

Fig. 6: Final impression

Fig. 7: Fabricated cast partial denture framework

Fig. 8: Metal framework trial

Fig. 9: Jaw relation

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Fig. 10: Facebow transfer

Fig. 11: Mounting on articulator

Fig. 12: Teeth arrangement

Fig. 13: Try in

Fig. 14: Denture insertion

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