

MANDIBULECTOMY — FROM RESECTION TO REHABILITATION: A REVIEW

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ABSTRACT

Oral cancer is becoming more common, which makes careful planning for the rehabilitation of mandibulectomy patients increasingly important. Removal of part or all of the mandible does not only compromise physical function; it also carries a significant psychological toll for the patient. A well-designed rehabilitation plan addresses functional, emotional, and social dimensions together, and in doing so restores a patient's sense of confidence. A combination of prosthetic and surgical approaches, chosen according to the individual case, allows for effective rehabilitation following mandibular resection.

KEYWORDS: carcinoma, grafts, mandibulectomy, rehabilitation.

INTRODUCTION

Resection of the mandible may become necessary for several reasons, including benign growths, malignant lesions such as squamous cell carcinoma and ameloblastoma, or traumatic injury. Depending on how far the pathology extends, the resulting defect is classified as either marginal or segmental. When carcinoma is present, the surgeon typically must remove adjacent soft tissue along with the bone itself, and the volume of hard tissue that remains afterward becomes central to planning the rehabilitation strategy. When the tongue is also involved, the rehabilitation process becomes considerably more complicated.^[1] A particularly troublesome complication is mandibular rotation, which arises because the muscle action normally supplied by the opposite side is no longer available. Reconstruction using a fibular graft has emerged as the leading approach for repairing mandibular defects, though rib grafts are also used in some cases.^[2] On the prosthetic side, rehabilitation can be achieved through several means — removable cast partial dentures, dental implants, and overlay dentures among them. Because these defects have such a direct bearing on a patient's overall quality of life, restoring function and appearance through rehabilitation is a priority rather than an afterthought.

ETIOLOGY

A break in mandibular continuity can result from trauma or from tumors, whether benign (such as ameloblastoma) or malignant (such as squamous cell carcinoma). Among these, squamous cell carcinoma stands out as the leading cause requiring mandibular resection,^[3] and it is strongly linked to the habit of chewing tobacco. When resecting in these cases, surgeons must maintain a cancer-free margin of at least 5mm.

CONSEQUENCES ASSOCIATED WITH MANDIBULAR DEFECTS

The lower third of the face draws much of its shape and appearance from the mandible, so defects here have an obvious cosmetic impact. Beyond appearance, several essential functions are disrupted as well — chewing, swallowing, speech, breathing, and even salivary flow can all be affected. Patients frequently struggle with visible disfigurement, speech that sounds slurred, a mandible that shifts noticeably when opening or closing the mouth, difficulty eating, and withdrawal from social situations — all of which combine to erode overall quality of life.

CLASSIFICATION

The system most widely used to categorize mandibular defects is the Cantor and Curtis classification, which distinguishes six classes: Class I- a radical alveolectomy in which mandibular continuity is preserved; Class II- lateral resection distal to the canine; Class III- lateral resection of the mandible; Class IV- lateral bone graft reconstruction; Class V- anterior bone graft reconstruction; and Class VI- resection of the anterior mandible without any reconstructive procedure to reunite the remaining lateral segments.

Jewer and colleagues proposed a separate classification system^[4] built around how complex the eventual restoration will be. In their scheme, a defect spanning canine to canine is described as C-shaped; a defect confined to the lateral mandible that spares the condyle is described as L-shaped; and a defect involving the lateral segment together with the condyle is described as H-shaped.

Additional classification schemes for mandibular defects have since been put forward by Boyd et al., Urken et al., and Petrovic et al.^[5,6]

RECONSTRUCTION AND REHABILITATION

Successfully rehabilitating a mandibulectomy patient is rarely the work of a single clinician — it calls for coordinated input from an oral and maxillofacial surgeon, an otorhinolaryngologist, a plastic surgeon, an oncologist, a prosthodontist, an implantologist, and a speech therapist. How much time and effort this process demands hinges on several variables: how extensive the tumor was, which area was resected, and whether the tongue was also affected (7).

Rehabilitation generally proceeds in two stages- beginning with surgery and followed later by prosthetic management.

Surgical rehabilitation^[8]

- a) **Primary closure:** The most straightforward closure technique, relying on healing by secondary intention. It is generally reserved for defects under 2cm.
- b) **Skin grafting:** Both split-thickness and full-thickness skin grafts are used in reconstruction, and both are associated with more favourable healing outcomes.

- c) **Alloplastic devices:** Mandibular reconstruction can also make use of mesh and plates. THORP plates (Titanium Hollow Reconstruction Plates) are a common choice, valued for the added stability they gain through bone ingrowth.
- d) **Autogenous bone grafts:** These fall into two categories — non-vascularized grafts and vascularized free bone flaps.
- i) *Non-vascularized grafts:* Suitable when the defect is smaller than 5cm or when the underlying tumor is benign.
- ii) *Vascularized grafts:* These flaps carry their own blood supply through vascular anastomosis, allowing healing to proceed even when the recipient site is compromised. The main variants include: a) the fibula free flap, the most frequently used option for mandibular reconstruction; b) the iliac crest free flap; c) the radial forearm free flap; and d) the scapula free flap.

Prosthodontic rehabilitation^[9]

Rehabilitation following marginal mandibulectomy

Fully edentulous patients: This group presents particular difficulty, since only a limited amount of mandibular bone remains and it sits close to the inferior alveolar and mental nerves. Where bone volume allows, an implant-supported prosthesis can be provided.

Partially edentulous patients: Here, a fixed or removable prosthesis — supported either by remaining teeth or by implants — is generally the treatment of choice. When the missing segment is anterior, options expand to include implant- or tooth-supported prostheses, clasp-retained partial dentures, and telescopic dentures. For posterior defects, the closeness of vital anatomical structures may mean bone grafting is required before implants can be placed.^[10] Conventional removable dentures remain a viable alternative in these situations as well.

CONCLUSION

Rehabilitation following mandibular resection meaningfully improves a patient's quality of life. It restores facial appearance, brings back masticatory function, improves speech, and ultimately enhances the patient's day-to-day wellbeing.

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