

R0- RESECTION OF MAXILLARY CARCINOMA WITH CHEEK, RETROMOLAR TRIGONE, AND INFRATEMPORAL INVOLVEMENT: A FEASIBLE SURGICAL APPROACH

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ABSTRACT

INTRODUCTION

Achieving R0 resection in cancers of the buccal mucosa and retromolar trigone with selective extension into adjacent structures remains surgically challenging. Tumour infiltration into regions such as the upper alveolus, maxillary antrum, and infratemporal fossa often necessitates complex approaches to ensure complete excision while minimizing morbidity.

METHODS

We describe a modified surgical technique involving an extension of hemi-mandibulectomy. The approach incorporates lateral partial mandibulectomy to improve access to the infratemporal fossa and facilitate excision of the retromolar region, combined with partial maxillectomy to achieve comprehensive tumour clearance. The technique is designed to optimize exposure and enable en bloc resection.

RESULTS

This approach allows effective access to anatomically complex regions, facilitating complete tumour removal with clear margins (R0 resection). It enables wide excision of tumours involving the buccal mucosa and retromolar

trigone with selective extension, while maintaining relatively low morbidity and acceptable functional outcomes.

DISCUSSION

The described modification offers a practical and effective strategy for managing advanced or selectively infiltrative tumours in challenging anatomical locations. By combining lateral partial mandibulectomy with partial maxillectomy, surgeons can achieve adequate oncological clearance with improved accessibility and patient acceptability. This technique may serve as a valuable alternative to more extensive procedures in appropriately selected cases.

KEY WORDS

malignancy maxillary antrum, retromolar trigone, upper alveolus, and infratemporal fossa

INTRODUCTION

The infratemporal fossa (ITF) involvement in malignancy of the maxillary sinus is considered a high-risk area, although not always an accurate prognostic factor to contraindicate surgery. With limited, although definite involvement of cheek, ITF, and retromolar trigone (RMT), a lateral facial

(mandibulotomy) approach may be feasible to control primary disease and achieve R0 resection. This was undertaken in a 56-year old male who presented with a proliferative squamous cell carcinoma in the right buccal mucosa extending to the upper gingivolabial sulcus (GBS), upper alveolus, and the anterolateral wall of the maxilla to further involve facial muscles together with the skin. A moderate trismus and induration in the upper right RMT were appreciated without any proptosis or diplopia or palpable cervical lymphadenopathy. The blood chemistry was within normal limits, and ultrasonography neck revealed 3 subcentimeter level II lymph nodes. CT scan revealed growth invading the right maxilla and destroying posterior wall, pterygopalatine and infratemporal fossa. The roof of the maxillary sinus was not involved. The overlying malar skin of around 1 cm diameter appeared to be infiltrated with the tumour. The patient was intubated through the left nostril and surgery was undertaken under hypotensive anaesthesia. An incision was given encircling the involved facial skin with 1cm healthy margins and extending laterally to the zygomatic complex (Figure 1). Intraorally, the mucosal cut was taken from the angle of the mouth encircling the tumour/in the GBS and RMT (with 1cm margins) up to the midline between the two central incisors. (Figure 2). The skin flaps were elevated, well away from the tumour. The ascending ramus of the mandible was exposed and cut transversely approximately 1cm from the gonion (Figure 3). To gain access into the ITF, the medial pterygoid insertion was divided. The zygomatic process was then exposed, and bony cuts were made across the zygomatic process and along the infraorbital margin up to the pyriform aperture, thus preserving the orbital floor, which was free from the tumor (Figure 4). The usual midline incision along the hard palate was made from between the incisors up to the

right choana, just near the nasal septum (figure 5). The upper part of the ascending ramus of the mandible was retracted laterally, and the muscular (lateral pterygoid) as well as the capsular (temporomandibular joint) attachments were incised to remove that segment to have full access to the ITF (Figure 6). The infratemporal fossa was cleared up, and the pterygoid plates were fractured with a gauge, thus completing the bony cuts (Figure 7). The mobilized maxilla with the ascending ramus and widely resected growth of the buccal mucosa was removed by dividing the soft tissue attachments. The mucosa of the maxillary antrum was removed with Luc's forceps, and final hemostasis was achieved. Subsequently, a right-sided neck dissection was performed, and the defect was repaired by the pectoralis major myo-cutaneous flap.

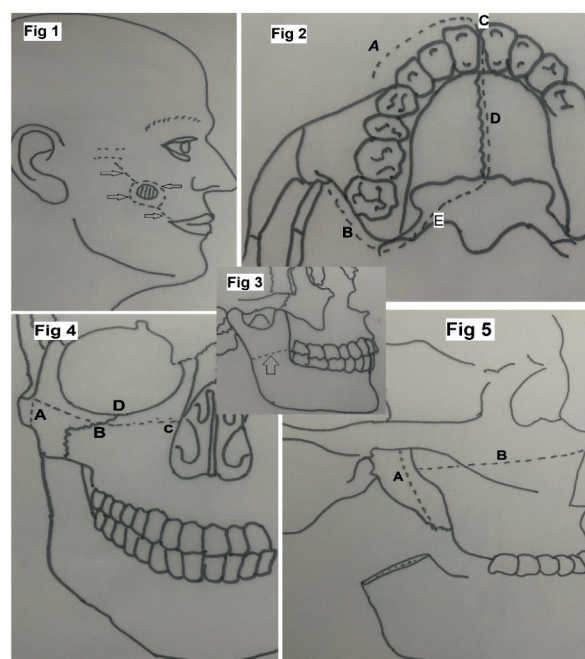


Figure 1: Facial incision parallel to facial nerve branches encircles the involved skin with 1cm healthy margins and further extends laterally to the zygomatic complex.

Figure 2: Intraorally, the mucosal cut encircles the tumour in the GBS (A) and RMT (B) (with 1cm margins) up to the midline between the two

central incisors (C). The midline incision is along the hard palate (D) from between the incisors up to the right choana (E), just near the nasal septum, aligning with the prior incision.

Figure 3: The ascending ramus of the mandible exposed and cut transversely approximately 1cm from the gonion.

Figure 4: The bony cuts are made across the zygomatic process (A) and along the infraorbital margin (B) up to the pyriform aperture (C), thus preserving the orbital floor (D) (free of tumor)

Figure 5: The ITF is exposed following removal of the upper segment of the ascending ramus after severing its muscular (medial/ lateral pterygoid) and capsular (temporomandibular joint) attachments. Following ITF clearance, the pterygoid plates are fractured with a gauge (A), thus completing the bony cuts along with previous cuts (B).

COMMENTS:

The concept of ITF involvement has undergone considerable advancements with better imaging, bloodless excision, adequate reconstruction, and the use of adjuvant postoperative radiation therapy to control microscopic disease. It can now be easily dealt with various routes of access, viz via the ramus, parotid, maxillary sinus or the submandibular region¹. Fisch infratemporal and preauricular subtemporal-infratemporal fossa approaches have also been considered as standard for isolated temporal and infratemporal fossa involvement². While the various surgical approaches to the maxilla are based upon the extent of tumour invasion, the ITF extension justifies something more than just a radical maxillectomy, as the latter would result in severe uncontrollable bleeding from pterygoid veins and a high probability of not achieving an R0 resection. A mandibular osteotomy has been

advocated for proper exposure to the anterior skull base, pterygomaxillary and infratemporal space, clivus, and nasopharynx³. In addition, a combined orbitofrontal, sub- and infra-temporal fossa approach has also been advocated for direct visualisation of the antero-temporolateral skull base from the orbital cavity to the depth of ITF and pterygoid fossa⁴. The standard Weber-Ferguson incision and subperiosteal flap elevation is not possible for the cheek skin involvement. Our attempt to modify the incision not only removes the involved skin but also does not compromise the vascularity much at the superomedial angle of the eye (as with Weber-Ferguson incision). The lateral extension of this incision should always be along the facial nerve branches. The midfacial degloving approach to sinonasal tumour and its extension⁵, is not justified here as the involved skin needs excision. The excision of the proximal segment of the ascending ramus of the mandible provides access to the ITF, removes the involved bone in the retromolar area to provide better hemostasis, and further prevents the chances of postoperative radiation-induced osteomyelitis. As the involvement of the posterior wall of the maxillary sinus and ITF are not accurate indicators of a bad prognosis, and since the primary cause of death is invariably the inability to control local disease⁶, every attempt must be made to achieve an R0 resection.

AUTHORS DECLARATIONS

Ethical Approval: Obtained

Consent to Participate: Obtained

Competing Interests: None

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Conflict of Interest: None

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