Case Report

Immediate reconstruction of palato-maxillary defect following tumor ablation using temporalis myofascial flap

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ABSTRACT

The resection of oral cavity tumor and malignancies often causes functional disabilities like deglutition and articulation. Maxillectomy is a very common surgical procedure carried out for the management of benign and malignant tumors of maxilla. Irrespective of the procedure, there is a common end result that is the defect. Several soft tissue flaps can be used for reconstruction of maxillectomy defect. Keeping the parameters of reconstruction in mind it is ideal to reconstruct the maxillary defect with either the free flaps or the regional flaps. Of all regional flaps, the temporalis myofascial flap (TMF) provides a high degree of reliability, vascularity, adequate bulk, and proximity to the defect in the oral and maxillofacial region.

Key words: Hemi-maxillectomy, palato-maxillary defects, temporalis myofascial flap

Introduction

The resection of oral cavity tumor and malignancies often causes functional disabilities like deglutition and articulation, and affects aesthetic outcomes.[1] Thus ablation procedures performed on the region of head and neck require synchronous tissue reconstruction in order to close the defect of the removed tumor. Palato-maxillary defects are inherently challenging and varied because they generally involve more than one mid-facial component, are composite in nature and the complex three-dimensionality of the region must be accounted for. It is important that the defect must be repaired in order to offer the patient a better aesthetic and functional outcome, thus it is advisable to perform immediately.[2,3] Various methods of palato-maxillary reconstruction include local plasty, regional flaps, and free grafts both simple and complex. The choice of reconstruction method should be based on reliability, length of surgical procedure, burden on the patient, and an acceptable functional and aesthetic outcome. Free flaps and regional flaps are best for reconstruction of larger defects. Free flaps have the advantages of availability of bulk, minimal donor site morbidity and vascularity. However, these flaps need a high degree of surgical and technical expertise and considerable operative time. Of all regional flaps the temporalis muscle provides a high degree of reliability, vascularity, adequate bulk, and proximity to the defect in the oral and maxillofacial region.[2-6]

We present our own experience in using the temporalis myofascial flap (TMF) for the reconstruction of palato-maxillary tissue following the extensive ablation of ameloblastoma of the maxilla without any complications.

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Clinical presentation

A 52-year-old male patient reported to the department with a long-standing massive swelling involving the full length of the right maxilla obliterating the right nostril and the labial vestibule [Figure 1]. The swelling was not painful and was firm to hard in consistency. There was

no change in the eye level or the intercanthal distance and no diplopia. Computed tomography (CT) scan of the maxilla showed involvement of the right side of maxilla and obliteration of the right side maxillary sinus and the nasal passage. The orbital floor was intact [Figure 2]. Incisional biopsy revealed desmoplastic ameloblastoma of the maxilla. Keeping in mind the size of the lesion hemi-maxillectomy with primary reconstruction of the maxilla with a TMF was planned under general anesthesia.

A Waber-Ferguson flap was used to remove the ameloblastoma of the right side of the maxilla, that is, hemi-maxillectomy. After removal of the lesion, a hemi-coronal incision was made with preauricular extension. Dissection was carried out just superficial to the deep layer of the temporalis fascia and inferiorly to the superior border of the zygomatic arch. Corresponding to the defect, an appropriate-sized TMF was elevated from its bony origin. Blunt dissection was carried out to create a tunnel underneath the zygomatic arch and posteriolateral wall of the maxilla. The myofascial flap was pulled through the tunnel and guided anteriomedially into the defect intraorally. With temporal fascia facing the oral cavity and covering the defect appropriately, the TMF was sutured meticulously to the contralateral side tissue [Figure 3]. The donor site was also sutured layer by layer.

The patient was discharged on the fifth postoperative day with no postoperative complications like necrosis of the flap, facial nerve deficit, cosmetic deformity, and change in mandibular movement. Complete secondary epithelialization of the TMF took 36 days [Figure 4].

Discussion

The maxilla is an important part of the mid-face, since it has a crucial role in facial appearance, the anatomical continuity of the nasal cavity, the palate, the orbit and in orofacial function.[3] For these reasons, when dealing with patients affected by tumors involving the maxilla, reconstruction of the surgical defect is essential.

Figure 1: Obliteration of the full maxillary vestibule on the right side

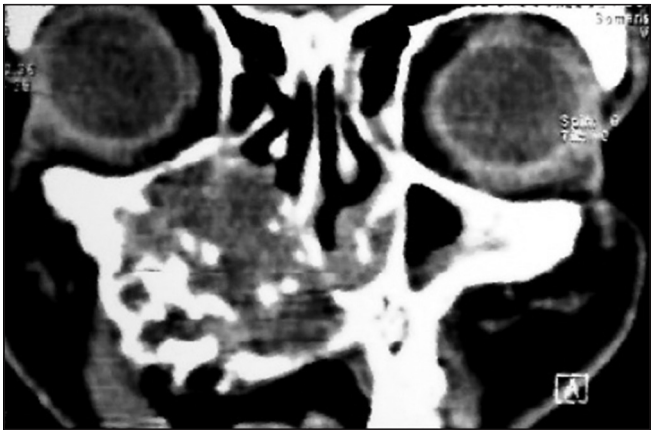

Figure 2: Coronal CT showing the extent of the tumor obliterating the full maxillary sinus and involving the nasal cavity on the right side

Figure 3: Temporalis myofascial flap bulk sutured in hemi-maxillectomy site

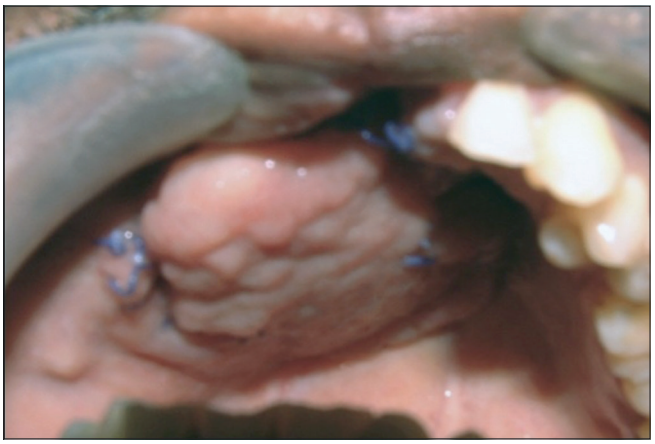

Figure 4: Intraoral picture of epithelialized temporalis muscle flap

Many reconstructive options are available including free flaps, microvascular flaps, distant flaps, and regional flaps. Reconstruction of the maxillary defect should be based on certain parameters, namely, defect size, area to be reconstructed, distance from the donor site, desired cosmetic aesthetic outcome, and function. However, there are a lot of limitations in terms of expertise and time required for the use of free flaps. Free flaps and other flaps require a second surgical site and have associated morbidity.[1,5]

Microvascular flaps nowadays replace traditional surgical techniques. However, a microvascularized free flap is not the appropriate solution for all patients.[3,5] Older people, patients with cardiovascular risk factors, or patients who are candidates to receive preoperative or postoperative radiotherapy may have a high risk of failure of the vascular anastomoses, with possible consequent flap loss and the need for a new surgical procedure.[5] Moreover, the duration of a microvascular flap reconstruction operation necessitates prolonged anesthesia that cannot be performed on all patients. In the present case, a safe and rapid reconstruction was preferred.

The TMF is a viable and versatile flap for the reconstruction of various defects of the maxillofacial region.[1,4-6] It has a highly reliable, predictable and efficient vascular supply located[4] on the deep surface of muscle that enables flap rotation through an effective arc of 120°-130°.[3] Its superficially adherent deep temporal fascia enable it to be used facing the oral cavity without any skin graft covering it.[1,7] The temporalis muscle can be split safely in the coronal plane, since the blood supply travels in the same direction. The vessel can be easily identified and preserved.[8,9] Due to adequate length and proximity to the oral cavity, it is an excellent flap to cover the defects in the maxilla.[4,5,8,10]

Reconstruction with TMF produces little functional deficit if the other muscles of mastication remain intact. Trismus has not been a problem.[1,4,5] The use of TMF have an advantage of availability of the bulk, minimal donor site morbidity and offers the reconstructive surgeon a wide range of possibilities for complex reconstruction.[1] TMF use in the oral cavity also eliminates the problem of hair growth in the mouth, which is a common problem with several other regional flaps.[4,10]

Another important aspect is to take advantage of the extra length of the middle or the posterior part of the myofascial flap for palato-maxillay defect reconstruction, which is consistently longer than the anterior one.[8] The TMF also provides sufficient bulk tissue to support the cheek. Its adequate length and flexible arc of rotation make it suitable to cover defects in the orbit, the maxilla, the complete palate, the mandible, the floor of the mouth, and the oropharynx.[8,10,11] In our case, too, we were able to suture the TMF up to the midline of the palate without any complication. However, some authors criticized the TMF for its short arc of rotation, moderate-sized defects measuring 4-8 cm,[12] and inability to reach the midline.[10]

TMF refers to an anteriomedial rotational arc for intraoral reconstruction to orient the temporalis fascia to the oral side.[8] Many authors emphasize placing the temporalis fascia on the oral side. This fascia is assumed to have a protective role for the muscle underneath.[8,10]

The TMF heals with secondary epithelialization unless occluding teeth traumatize the flap and complete epithelialization occurs in 4-6 weeks.[1,10,12] Once epithelialization is complete, the new mucosal surface covering the muscle is indistinguishable from surrounding mucosa.[10] The TMF can also be used as a soft tissue bed for further placement of the bone graft.[13] Many authors reported good results in speech, swallowing, and appearance after the reconstruction of maxillary defects with TMF.[1-7] This has been observed in the present case also.

The literature on the use of TMF for reconstruction of intraoral defects has shown the flap failure rate to be very low[12] (1.6%) and the incidence of associated postoperative complication to be minimal and mostly transient.[1,6,10,11,14] Total loss of the flap is reported to occur when it is brought to the defect through a fenestration of the posterior and medial wall of the maxillary sinus to reconstruct mid-palatal defects.[10,11]

Donor site morbidity is minimal,[1,5,14] moreover, using the anterior part of the muscle can reduce cosmetic deficit in the donor site and advancing the posterior part of the muscle may restore the deficit and more over. Hair can easily camouflage most of the temporal depression.[10,12]

Conclusion

The TMF provides a high degree of reliability, vascularity, adequate bulk and proximity to the defect in the oral and maxillofacial region. The TMF can be considered as a first-line reconstructive option for maxillary defects. Acceptable functional and aesthetic outcomes can be expected in high rates. The TMF should be taken into consideration before deciding on more extensive reconstructive procedures.

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