Original Article

Alveolus Reconstruction Using Submental Artery Flap After Wide Excision Of Maxillary Adenoid-Cystic Carcinoma

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Abstract

Introduction The reconstruction of intraoral soft tissue and bony defects is important to restore function and esthetics. For large defects, there is a need for regional pedicled flaps or free flaps. The hard palate separates the nasal and oral cavities. Due to the small remaining surface area between the flap and the palate after surgical resections, an optimal blood supply to the flap is required for reconstructions of the hard palate. **Case Report** This article demonstrates the immediate reconstruction with submental island flap of a patient with partial maxillectomy after wide excision of maxillary adenoid cystic carcinoma and discusses a brief overview of this flap. **Conclusion** The submental island flap is an effective and reliable method for intraoral reconstruction of large soft-tissue defects in the oral cavity. Morbidity at the donor site is low and the remaining scar is unremarkable. Head and neck surgeons familiar with the facial artery and its branching pattern make this flap an appropriate choice for clinical practice.

Keywords: facial artery, hemimaxillectomy, Surgical flaps.

Introduction

Reconstruction of oral soft tissues is important to restore function and esthetics and improve quality of life after surgical resections of malignant lesions of the oral cavity. For large defects, pedicled regional flaps or free flaps are needed (1). Large maxillary defects are critical for reconstruction. The palate separates the nose from the oral cavity. The communication of these cavities after surgical resection of palatal lesions results in difficulties in speaking, in eating, and in maintaining hygiene (2).

Reconstruction of maxillary defects involving alveolar processes and hard palate is difficult. Only the periphery of the flap is in contact with the bed, so most of the blood supply depends on the supplying vessels of the flap, and diffusion from the receiving bed plays only a minor role. The submental arterial island flap is an effective way to solve this problem. The advantages of this flap include the large skin paddle, its axial blood supply, low morbidity at the donor site, and proximity to the oral cavity.

Case Report

A 42 years old female patient had large biopsy proven right sided maxillary alveolar adenoid cystic carcinoma that extended from midline to the right side premolar area It extended laterally to upper vestibule and medially to midline **(Fig.1).** It was resected under general anesthesia with 1cm safety margins using resection guide.

Fig.1: Surgical guide of alveolar resection

Surgical Method

The submental artery island flap was used for immediate reconstruction of defects after maxillectomy. A composite island submental flap (4cm vertical x 6 cm transverse) was harvested with the inferior border of mandible (1 cm vertical x 6 cm transverse) (Fig.2&3).

Fig.2: Submental flap design

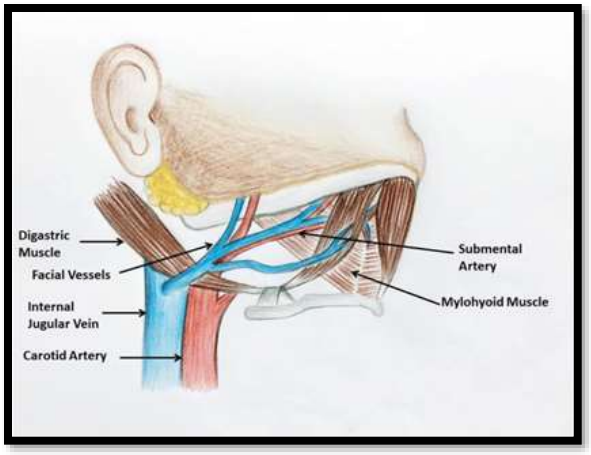

Fig.3: Vascular pedicle of the SAIF

The marginal mandibular branch of the right facial nerve was identified and preserved during elevation the flap. A mylohyoid muscle perforator supplying the mandibular segment along with the right anterior digastric muscle was included to ensure adequate blood supply. The pedicle was fully dissected with submental artery and vein. Soft tissue and bone perfusion was confirmed with a Doppler probe. The flap was transposed through a subcutaneous tunnel in the inferior aspect to the maxillary defect. The right maxillary alveolar defect was reconstituted with vascularized mandibular bone by manipulate fixation. Most of the mucosal defect was reconstructed with SIF.The donor site was the submental area at a distance of 1 cm from the lower edge of the mandible.

The shape of the paddle was spindle-shaped. The width of the paddle depends on the laxity of the skin. In elderly patients with excess skin on the neck, we can choose wide skin flaps while primary closure of the donor site is still possible. After designing the skin paddle, the first step was to identify the facial artery and vein. After that, the dissection starts from the non-pedicle side and extends toward the midline. The dissection was performed in the subplatysmal plane. In the midline, the anterior belly of the digastric muscle and the mylohyoid muscle on the side of the pedicle were included in the dissection **(Fig. 4 &5).**

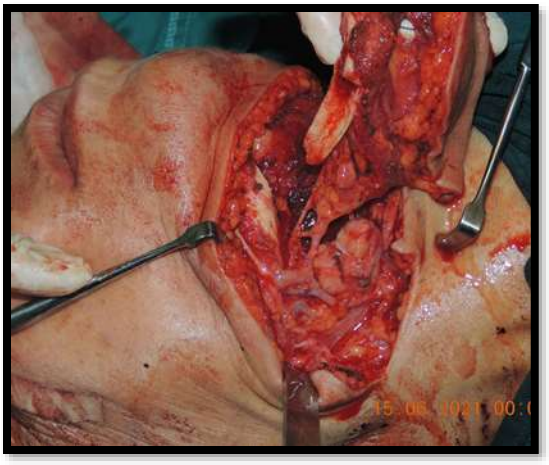

Fig.4: Osteocutaneous SAIF pedicle

Fig.5: The donor site ped

The pedicle of the flap contains the submental artery and vein without skeletonizing them. A submucosal tunnel was created between the buccal border of the postmaxillectomy defect and the extra oral incision. The submental flap was placed into the oral cavity through this tunnel and anchored to the remaining intact hard palate with bone sutures using 3-0 Vicryl® suture (Fig. 6). Direct closure in layers of the donor site in the neck with drain was done after good hemostasis.

Fig.6: The insetted SAIF in oral cavity

Discussion

The submental island flap (SIF) is an excellent option for reconstructing a variety of defects that extend beyond the lower facial region. Several studies have described the practical benefits of SIF, including safe dissection, better outcomes compared to forearm radial free flaps for similar defects, and excellent cosmetic outcomes at both the defect and donor sites [3, 5, 11-15]. Compared to free-flap alternatives, the SIF offers several advantages, including shorter operating times, lower healthcare costs, and no requirement for microvascular experience [3, 13].

The SIF can also be used in elderly patients to avoid the risks associated with free flap reconstruction. From an operational perspective, SIF offers an aesthetically concealed donor site, excellent facial color matching, a wide axis of rotation and a large area of well-vascularized soft tissue [3, -7]. In addition, the flap is thin and does not contain bulky muscle tissue like other regional flaps [3]. These features of SIF avoid the need for multiple pedicle divisions and the sacrifice of functional muscles [3].

An osteocutaneous flap can also be harvested using the mandible as a source of vascularized bone, as shown in in our report [7, 13]. Limitations of SIF include unwanted hair growth on the flap and the much more worrying potential malignant lymph node transmission in the upper neck leading to recurrent cancer [3]. Selection of patients is important: there is no increased risk of recurrence when using SIF in clinically node negative patients [16]. To date, reconstructive applications of SIF have mainly focused on the lower face, oral cavity and pharynx. Our demonstration of the SIF composite for the reconstruction of facial defects affecting the maxilla as part of the midface has been previously described in a few cases.

Conclusion

The island flap of the submental artery is an effective and reliable method for intraoral reconstruction of large soft tissue defects in the oral cavity. Morbidity at the donor site is low and the remaining scar is unremarkable. Head and neck surgeons familiar with the facial artery and its branching pattern make this flap a viable option for clinical practice.

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