**SUBMENTAL FLAP IN CERVICOFAcial RECONSTRUCTION- A CASE REPORT AND REVIEW OF LITERATURE**

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**ABSTRACT**

**BACKGROUND**

Submental flap was first described by Martin et al in 1993.¹ Since then it has been used in reconstruction of various defects following Head and Neck surgery. The broad versatility of the flap such as equivalent match to the facial skin colour, thickness, texture, wide arc of rotation, ease of harvesting the flap, short time for dissection and the availability of lax skin of the neck in elderly makes it a choice of reconstruction in morbid patients requiring short time of anaesthesia. This flap is based on submental artery. We present a case report of Basal cell carcinoma of left post aural region in an 80-year-old female, who underwent wide local excision of the lesion with superficial parotidectomy, which left a large defect of around 8 x 5 cm in dimension. The defect was resurfaced using pedicled submental flap with short duration of operating time. The pedicled submental flap had an excellent uptake with perfect skin tone match, concealed donor site scar under the mandibular arch and good range of neck movements. Submental flap can be used as free flap or pedicled flap. Even though it has many advantages of its own in selected patients, some of the drawbacks include flap failure due to anatomical variations of the perforating branches of the submental artery and cannot be used in aggressive malignant tumours of the oral cavity, which may frequently metastasise to level I lymph nodes. Here, we discuss the pertinent anatomy, surgical technique of harvesting the flap, its drawbacks and review of literature of submental flap in Head and Neck reconstruction.

**KEYWORDS**

Submental Flap, Basal Cell Carcinoma.


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Reconstruction after uprooting of Head and Neck Cancer is required to restore the defect left out. Various methods have been used to accomplish it which include primary closure, rotation flaps, pedicled flap and free tissue transfer. But each technique has its own advantage and disadvantage, which a surgeon must consider while selecting an appropriate reconstructive method according to the patient’s need, especially in the region of head and neck which have special cosmetic concern.

In an era of free tissue transfer, local flaps have their own unique place in selected patients. One of such flap is submental flap, an axial patterned flap based on submental artery first introduced by Martin et al in 1993.¹

Submental flap has its own advantages such as minimal donor site morbidity, outstanding cutaneous colour, thickness, match and pliability. Its ease, short time for dissection and the availability of lax skin of the neck makes it a choice of reconstruction in morbid patients requiring short time of anaesthesia. We report its use in a case for facial reconstruction and review of literature.

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**CASE REPORT**

An 80-year-old female presented with itchy bleeding ulcer behind the left ear for the last 10 years. Initially, the lesion was around 0.5 x 0.5 cm in dimension, which progressively increased in size and presented as non-healing ulcer about 4 x 3 cm in dimension. There was no history of pain or trauma or chronic irritation. No history of any other associated co-morbidities.

**On Examination**

An ulceroproliferative lesion measuring around 3.5 x 4 cm present over the left retroauricular region with blackish pigmentation all around the ulcer with irregular borders. Ulcer bleeds on touch. No associated lymphadenopathy. Systemic examination was normal.

**Investigation**

Laboratory investigations were normal. The histopathological examination of the wedge biopsy taken from the ulcer was reported as Basal Cell Carcinoma. Then the patient underwent CT Scan of head and neck, which showed as Heterogeneously enhancing ill-defined mass lesion noted in left retroauricular region measuring about 2.4 x 1.2 x 2 cm. Anteriorly the lesion extending into the left parotid space and fat planes between the lesion and the left parotid gland are indistinct suggestive of invasion.

**Management**

She underwent wide local excision of the lesion with a 2-cm margin all around and left side superficial parotidectomy as the lesion was involving the parotid (Fig 1 and 2). The defect was repaired using a pedicled submental island flap. Primary closure of the donor and the recipient site was done. The
maximal paddle width was 9 x 6 cm in dimension (Fig. 3, 4, 5 and 6). The duration of flap raising and resurfacing the defect was around 30 - 40 minutes. She made an uneventful postoperative period and was discharged on postop day 3 and suture removal done on postop day 7 (Fig. 7 and 8). The submental flap used in this elderly patient gave an excellent lax submental tissue and colour match. The donor and the recipient area healed well with no dysesthesia or restricted neck movement and no wound gaping (Fig. 9).
Surgical Technique

A careful history and physical examination should be undertaken before surgery as into there has been no previous neck surgery or radiation, which would contraindicate the flap. The patient is put in supine position with neck extended. After measuring the defect, an elliptical shaped flap is outlined with a marking pen in the submental region in a horizontal design. Care is taken during this step not to extend the upper limit too far anteriorly, so as to hide the scar as much as possible. The lower limit of the flap is drawn after measuring the maximum skin paddle width consistent with primary closure, which can be easily determined by pinch test. Elevation of the flap can be started from the contralateral or ipsilateral side of the pedicle in either sub-platysmal or supra-platysmal plane till midline with care taken to stop subdermal bleeding with bipolar diathermy. Then the dissection is carried out from midline to identify submental artery and vein at the medial border of anterior belly of digastric muscle. Doppler probe is used in this step to identify the vessels. Once the submental vessels are visualised, the anterior belly of the digastric muscle is dissected off from its attachment to mandible and hyoid bone and included with the flap to protect the terminal vascular supply, as it passes deep to the muscle in most cases. The dissection is carried out till lateral border of mylohyoid, taking care to identify and protect marginal mandibular nerve. The mylohyoid muscle is either cut or a strip is included with the pedicle if the flap needs to be tunneled medial to the mandible for intraoral reconstruction. The dissection is advanced till adequate length of vascular pedicle is derived or till the origin of submental artery, which branches out from the facial artery. To increase the length of the pedicle the facial artery and vein is divided distal to the origin of the submental vessels and facial vein is re-anastomosed using microvascular techniques to the retromandibular vein. The flap is then transferred to the recipient region and primary closure of the donor site is done.

The advantages of a submental flap include its minimal donor site morbidity, excellent cutaneous colour, texture, thickness match and pliability. In men, this may be useful for reconstructing hair-bearing defects. The width of the flap can be as large as 18 x 7 cm in dimension and the pedicle length can reach up to 5 cm.

Prior radiotherapy to the neck, previous neck dissection that interrupt the submental artery and in aggressive malignant tumours of the oral cavity, which may frequently metastasise to level 1 lymph nodes become the major drawbacks for usage of submental flap.

In a multi-institutional retrospective study, Paydarfar et al(7) compared the outcome of 27 submental flaps with 33 radial forearm free flaps. Reconstruction of oral cavity defects with the submental flap results in shorter operative time and hospitalisation without compromising functional outcomes. The submental flap may be a preferable option in reconstruction of oral cavity defects less than 40 cm².

To evaluate the oncologic safety of the submental flap regarding potential transposition of involved nodes to the reconstruction site and recognise the submental flap as an excellent option for oral cavity reconstruction was studied retrospectively by Howard et al.(8) No recurrence was found intraorally at the site of reconstruction, even though 10% of the cases had occult metastases found at level 1.

Hayden et al.(9) described by retrospective evaluation of all submental flaps undergoing pedicle-lengthening procedure that the hybrid submental flap safely extends the arc of rotation 5 cm allowing coverage of defects in the forehead, temporal-parietal and occipital regions.
Ramkumar et al\cite{10} described a bi-paddled submental flap after retrospective review of records, where they used one paddle for providing the lining of the oral cavity and the other for covering the full thickness defect.

Burić et al\cite{11} described a submental flap, in which they removed the skin from part of the paddle and prelaminated it with oral mucosa. They then used this part to reconstruct the defect involving nasal mucosa. A similar reverse facial artery-submental artery deepithelialised submental island flap is safe, quick and simple to use or elevate. The flap is a reliable technique for reconstructing maxillary defects following cancer ablation.\cite{12}

A multi-parameter evaluation of morbidity associated with submental flap by Lee et al\cite{13} in twenty-two patients (20 men and 2 women; mean age, 56 yrs.) underwent reconstruction with a submental flap after head and neck tumour ablation, showed that there was minimal effect on smiling, whistling, beard shape and neck extension. They also found that primary closure of the skin had good cosmetic outcome.

CONCLUSION
Submental flap is an excellent choice for head and neck reconstruction because of its versatility, skin tone match, ease of its application and reliable blood supply; preferably can be used in elderly morbid patients in whom longer duration of general anaesthesia is unsafe.

REFERENCES
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