Case Report

Submental Island Flap Can Be a Good Option for Tongue Reconstruction : A Report on Two Cases

Fahmida Ferdousi[1], Motiur Rahman Molla[2], Golam Mohiuddin Chowdhury[3]*

1. Associate Consultant, Department of Dental & Maxillofacial Surgery, Evercare Hospital Dhaka
2. Sr. Consultant & Coordinator- Department of Dental & Maxillofacial Surgery, Evercare Hospital Dhaka
3. Sr. Consultant, Department of Dental & Maxillofacial Surgery, Evercare Hospital Dhaka

**** Address for Correspondence:***
Dr. Fahmida Ferdousi
Associate Consultant,
Department of Dental & Maxillofacial Surgery
Evercare Hospital Dhaka
E-mail: Fahmida.ferdousi@evercarebd.com

Date of submission: *29.07.2025*
Date of acceptance: *20.08.2025*

ABSTRACT

This report describes two successful cases of lateral tongue squamous cell carcinoma (SCC) reconstructed using a submental island flap following surgical resection.

Case 1: A 59-year-old woman, presented with a 3.1 × 5.4 cm lesion on the left lateral tongue. She underwent wide local excision with supraomohyoid neck dissection, followed by reconstruction using a 7 × 4 cm pedicled submental island flap comprising skin, subcutaneous tissue, platysma, anterior belly of the digastric, and part of the mylohyoid muscle. Postoperative recovery was uneventful. At six months, she had regained oral intake and speech. Two-year follow-up confirmed excellent functional and aesthetic outcomes with no donor-site morbidity.

Case 2: A 45-year-old man with grade II squamous cell carcinoma of the left lateral tongue (1.5 × 1.8 cm, depth of invasion 10 mm), underwent wide local excision with supraomohyoid neck dissection. A submental island flap was used for reconstruction. Recovery was smooth, with restoration of oral function by the second postoperative week. Beard growth over the flap was managed successfully with laser depilation. At one-year follow-up, healing was complete with satisfactory functional outcome.

These cases highlight the submental island flap as a reliable, well-vascularized, functionally effective, and cosmetically acceptable option for tongue reconstruction after oncologic resection. It offers a resource-efficient alternative to free microvascular flaps, avoiding the need for microsurgical anastomosis and minimizing donor site morbidity.

Key words: *Submental island flap, Tongue reconstruction, Pedicled flap, Oral and maxillofacial surgery, Donor-site morbidity, Functional outcomes*

INTRODUCTION

The submental island flap (SMIF) is a pedicled fasciocutaneous flap harvested from the submental region beneath the chin. It is a composite flap incorporating skin, subcutaneous fat, and underlying muscle, with its vascular supply maintained through the submental artery[1]. This flap is frequently employed for reconstruction of defects in the lower face, floor of the mouth, tongue, cheek, and oropharynx, providing a reliable and versatile solution[2,3,4]. Its advantages include minimal donor-site morbidity, excellent cosmetic outcomes, and the provision of well-vascularized tissue, making it an invaluable tool in oral and maxillofacial reconstruction4. In reconstructing defects after oncologic resections, micro vascular free flaps have become the preferred choice for addressing complex defects[5]. However, free flaps are not feasible or suitable in every case. As an alternative, particularly for oral cavity defects, the submental pedicled flap has proven highly effective[2,3]. First described by Martin et al. in 19931, the submental flap is a fasciocutaneous flap whose use is somewhat limited by the technical challenge of preserving its pedicle during submandibular lymph node dissection. However, the advantages of this flap are quite remarkable, particularly when used in tongue reconstruction and cervicofacial skin defects. It provides tissue of excellent quality, causes very little donor-site morbidity, and allows for skin paddles that can range generously from 7 up to 18 cm, making it highly versatile for different reconstructive needs[4,6].

Case Report 1: Submental Island Flap Reconstruction for Lateral Tongue Defect

A 59-year-old female patient presented to the Dental and Maxillofacial Surgery Department of Evercare Hospital with a three-month history of a

painful, exophytic ulcer on the left lateral tongue border (Fig 1). Clinical examination revealed no palpable cervical lymphadenopathy. An incisional biopsy confirmed moderately differentiated squamous cell carcinoma (SCC).

The tumor involved the left lateral aspect of the tongue and required wide local excision (Fig 2), resulting in a significant soft-tissue defect (Fig 4). Due to the location and size of the defect, the patient was considered unsuitable for large free flap reconstruction, which would have led to substantial donor-site disfigurement. Therefore, a submental island flap (SMIF) was selected for reconstruction (Fig 3). Under general anesthesia, a 7 × 4 cm flap was elevated incorporating skin, subcutaneous tissue, platysma, the anterior belly of the digastric, and part of the underlying mylohyoid muscle. This flap was harvested from the submental region, preserving its vascular pedicle. The flap was transposed intraorally via a subcutaneous tunnel and secured to the tongue defect and sutured into the recipient site.

Postoperative recovery was uneventful, with good flap perfusion and no donor-site complications. The patient resumed oral intake and speech with minimal difficulty. Follow-up at 6, 12 and 24 months demonstrated complete wound healing with satisfactory functional and cosmetic outcomes. The SMIF thus proved to be a reliable reconstructive option in this case, providing well-vascularized

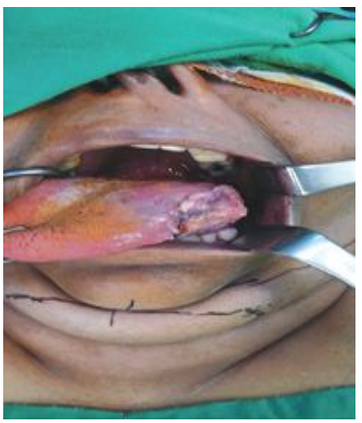

Figure 1 : Preoperative clinical image showing the ulcerated lesion along the left lateral border of the tongue.

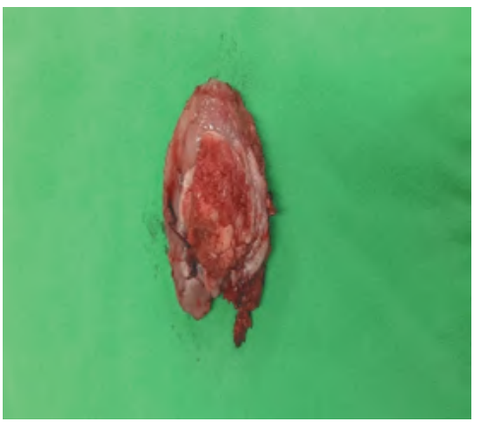

Figure 2 : The excised tumor specimen with wide margins resulting tongue defect, highlighting the need for reconstruction to preserve function

Figure 3 : Preoperative planning with marking of the submental island flap. The elliptical skin paddle was designed along the inferior mandibular border, ensuring adequate tissue for reconstruction

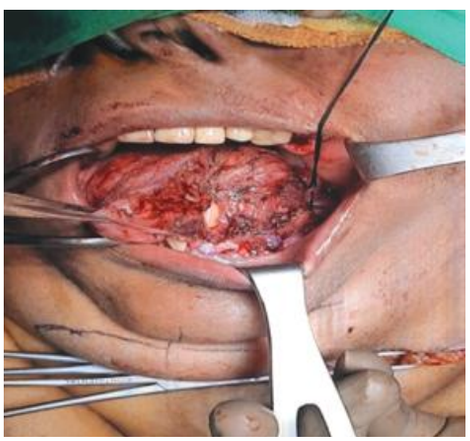

Figure 4 : Intraoperative photograph showing the surgical defect of the lateral tongue after tumor excision, highlighting the significant soft-tissue loss.

Figure 5 (A) : Follow-up at 6 months (A) and 24 months (B) demonstrating excellent flap integration, tongue mobility, and concealed donor-site scar. The reconstructed tongue maintains contour and mucosal match, with no evidence of contracture or atrophy **Figure 5 (B):** After two years of Flap insertion

tissue with minimal donor-site morbidity(Fig 5A & 5B).

Case Report 2: Submental Flap Reconstruction with Neck Dissection

A 45-years-old male patient presented to the Dental and Maxillofacial Surgery Department of Evercare Hospital with an ulcerated exophytic growth along the left lateral border of the tongue. Histopathological examination confirmed moderately differentiated (grade 2) squamous cell carcinoma.

MRI of the maxillofacial region and neck showed an ill-defined mass at the anterolateral margin of the left side of tongue measuring approximately 1.5 × 1.8 cm with a depth of invasion of 10 mm. Sub centimetric lymph nodes were noted at left levels 1b, 2, and 5, the largest with a short-axis diameter of 1.2 cm.

A wide local excision with a 2 cm margin was planned, along with a supraomohyoid neck dissection and reconstruction using a submental island pedicled flap, as no significant nodal involvement was evident on imaging. After three-dimensional excision of the lesion with intraoperative frozen-section confirmation of clear margins, the neck dissection was completed up to supraomohyoid level, carefully preserving the submental artery and vein. Reconstruction of the tongue defect was then performed with the submental island flap (Fig 6,7 & 8).

Figure 6 : Intraoperative view of the incision used for harvesting the submental island flap, placed along the submandibular crease

Figure 7 : Elevation of the submental island flap while preserving vascular supply

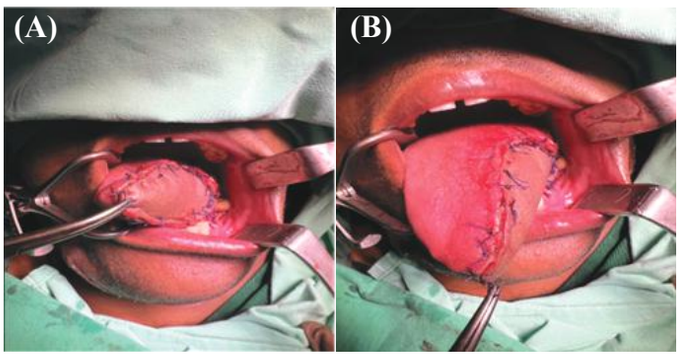

Figure 8 (A): Immediate postoperative appearance of the flap after transfer into the tongue defect, with sutures securing and viable paddle in position showing good perfusion and tension-free closure. **(B):** Immediate postoperative appearance of the flap after transfer into the tongue defect, with sutures securing and viable paddle in position showing good perfusion and tension-free closure

Figure 9 : Clinical appearance one week after surgery, demonstrating flap survival, early healing. Beard hair on the skin island is visible

Figure 10 : Six-month follow-up photograph showing healed flap, satisfactory tongue mobility and good cosmesis with residual beard growth

Figure 11 : One-year result after laser depilation, achieving optimal cosmesis and oral function

The postoperative course was uneventful, with complete flap survival and no evidence of infection or donor-site complications (Fig 9 & 10). The patient resumed oral intake by the second postoperative week and achieved intelligible speech with minimal difficulty. Beard growth was noted on the transferred skin paddle (Fig 9), given the patient's male sex, and this was successfully managed with laser depilation. Follow-up evaluations at 3, 6, and 9 months demonstrated complete wound healing (Fig 10 & 11), normal tongue mobility, and no evidence of recurrence, with excellent functional and aesthetic outcomes confirmed by both clinical assessment and patient-reported measures.

DISCUSSION

The submental flap can be harvested as a fasciocutaneous or fasciomusculocutaneous flap, incorporating the anterior belly of the digastric and the mylohyoid muscles[5,6]. It is primarily indicated for oral cavity reconstruction and other defects within the lower two-thirds of the face [2,4]. The flap is relatively easy to raise, has good vascularity, variable dimensions, and does not require microsurgical anastomosis [4]. Furthermore, donor-site complications are minimal, and its functional and aesthetic results are comparable to those of free flaps[1,7].

Surgical Anatomy: The flap's vascular supply derives from submental artery, a consistent branch of the facial artery, courses forward and medially between the submandibular gland and the mylohyoid muscle [1]. It travels either deep (70%) or superficial (30%) to the anterior belly of the digastric, terminating near the mandibular symphysis. Along its course, cutaneous perforators traverse the platysma and the digastric to form an extensive subdermal plexus with anastomoses across the midline. Venous drainage occurs via the submental vein into the facial vein, with communications to both the internal and external jugular veins[4,5].

Flap design and surgical technique: The flap design is determined by the defect size and the available skin laxity, assessed by pinch test 4.An elliptical skin paddle is marked, with its superior incision along the inferior mandibular border (from angle to angle) and the inferior incision positioned to allow tension-free closure[8]. Initially, a subplatysmal lower cervical flap is elevated down to the clavicle to aid closure [4]. The upper cervical flap is raised with meticulous identification and preservation of the marginal mandibular nerve 8. The dissection proceeds to expose the superior border of the submandibular gland, carefully tracing the facial and submenta lvessels[1]. The anterior dissection typically includes the ipsilateral anterior belly of the digastric muscle, with the platysma sutured to the skin paddle to preserve its perforators [4,8]. The flap is then elevated to the midline. If a proximally based flap is required, the facial artery is ligated proximally to the submental branch[4,5]. The submandibular gland is dissected off the facial vessels with ligation of glandular branches[8]. The facial vein, with its variable drainage pattern, requires careful preservation[1,8]. During neck dissection, the flap can be temporarily tacked to the facial skin[4]. It is then tunneled lateral to the mandible for buccal defects or medial to the mandibular border for tongue reconstruction [8].

Indications: The submental island flap is widely used in maxillofacial oncologic reconstruction, especially for oral cavity tumors [2,4,7]. Indications include reconstruction of tongue and/or floor-of-mouth defects, buccal mucosa, palate, large lip defects, and soft-tissue defects of the lower, middle, and upper face[7,9]. Additional applications include reconstruction of the beard area, nasal reconstruction, cervical esophagus repairs, hemilaryngectomy and nasopharyngeal reconstructions following total laryngectomy, and closure of pharyngocutaneous fistulas [4,9].

Advantages: The submental island flap offers several significant advantages in head and neck reconstruction. Its versatility allows it to conform to a variety of defect shapes and sizes, making it adaptable to numerous surgical scenarios[2,4]. The flap benefits from good vascularity due to its reliable blood supply, which significantly reduces the risk of flap failure[4,5]. From a cosmetic perspective, it provides excellent outcomes as the donor-site scar is well-concealed within the natural

submental crease[4,7]. Furthermore, it is a cost-effective alternative to free flaps, as it avoids the need for complex microsurgical techniques, thereby reducing both operative time and associated costs[8,10].

Limitations and complications: Despite its advantages, the flap is contraindicated in patients with prior neck dissection, facial artery compromise, or significant neck irradiation which may jeopardize vascular integrity [8,10]. Oncologic safety concerns arise with advanced level I nodal metastases, where flap harvest could interfere with adequate lymphadenectomy[8]. While complications such as venous congestion, partial necrosis, or donor-site infections are rare, they underscore the importance of patient selection and technical precision [8,10].

CONCLUSION

Reconstruction with submental island flaps is a highly effective reconstructive technique in oral and maxillofacial surgery. The two case studies in this report demonstrate their reliability, versatility and efficacy for reconstructing soft-tissue defects following oral cancer resection.

REFERNECES

1. Martin D, Pascal JF, Baudet J, et al. The submental island flap: a new donor site. Anatomy and clinical applications as a free or pedicled flap. Plast Reconstr Surg. 1993;92(5):867-73.
2. Akçay TO, Ulu MO, Kipöz A, Atabey A, Günhan O. Submental island flap for reconstruction of intraoral defects. J Craniofac Surg. 2011;22(3):929-32.
3. Hayden RE, Mullin DP, Patel AK. Reconstruction of oral cavity defects. Atlas Oral Maxillofac Surg Clin North Am. 2013;21(1):65-78.
4. Ichinose A, Tahara S, Terashi H, Nakajima H. Clinical application of the submental artery flap for head and neck reconstruction. J Plast Reconstr Aesthet Surg. 2008;61(3):275-81.
5. Gurtner GC, Evans GRD. Microvascular reconstruction of composite oral and maxillofacial defects. Plast Reconstr Surg. 2000;106(3):505-14.
6. Sakai S, Soeda S, Ishikawa K, et al. The submental flap for intraoral reconstruction: clinical application and anatomical study. Plast Reconstr Surg. 1997;99(2):421-8.
7. Chow TL, Yuen AP, Fung SC. The submental island flap in head and neck reconstruction. Hong Kong Med J. 2008;14(2):135-9.
8. Tarsitano A, Vietti MV, Cipriani R, Mazzoni S, Marchetti C. Submental island flap in oral cavity reconstruction: our experience on 34 cases. Int J Oral Maxillofac Surg. 2015;44(3):345-51.
9. Türegun M, Kalender ME, Yilmaz M, Selimoglu MN. Clinical experience with the submental artery island flap in oral cavity reconstruction. J Craniofac Surg. 2009;20(6):2166-70.
10. Ferrari S, Ferri A, Bianchi B, Copelli C, Poli T, Sesenna E. The submental island flap: anatomic basis and clinical applications. J Craniofac Surg. 2013;24(2):552-7.