



SUBMENTAL ARTERY ISLAND FLAP IN HEAD AND NECK RECONSTRUCTION:
INSTITUTIONAL EXPERIENCE AND FUNCTIONAL OUTCOMES

General Surgery

Dr. Shafaq
Farooqui

Junior Resident, Department of General Surgery, Index Medical College, Indore, India

Dr. Amit Katlana

Professor & Head, Department of General Surgery, Index Medical College, Indore, India

ABSTRACT

Background : Oral cavity malignancies are highly prevalent in India and often require extensive surgical resection followed by reconstruction. While microvascular free flaps remain the gold standard, they demand significant expertise and resources. The Submental Artery Island Flap (SIF) offers a reliable, simpler alternative. **Methods :** A prospective observational study was conducted from December 2024 to October 2025 including 25 patients with oral/oropharyngeal squamous cell carcinoma. All patients underwent tumor resection followed by SIF reconstruction. Outcomes assessed included flap viability, functional recovery, cosmetic results, complications, and oncological safety. **Results :** Flap survival rate was 96%, with only 4% partial necrosis and no total flap loss. Mean operative time was 3.5 hours. Oral intake resumed by postoperative day 3–4, and all patients achieved normal swallowing and intelligible speech. Cosmetic outcomes were excellent in 84% of patients. Complications were minimal, with no donor-site morbidity or nerve injury. **Conclusion :** SIF is a safe, reliable, and aesthetically favorable reconstructive option for small-to-moderate oral cavity defects, particularly in resource-limited settings.

KEYWORDS

Submental artery flap, oral cancer reconstruction, pedicled flap, head and neck surgery, functional outcome

INTRODUCTION

Oral cavity cancers represent a significant healthcare burden in India, largely due to tobacco consumption. Surgical excision remains the primary treatment modality, often resulting in complex defects requiring reconstruction.

Microvascular free flaps are widely used but are associated with prolonged operative time, need for specialized expertise, and increased resource utilization.

The Submental Artery Island Flap (SIF), a pedicled flap based on the submental branch of the facial artery, offers several advantages including:

- Good color and texture match
- Concealed donor site
- Short operative time
- Minimal morbidity

This study evaluates the reliability, functional outcomes, and oncological safety of SIF in head and neck reconstruction.

AIMS AND OBJECTIVES

- To evaluate flap survival and reliability
- To assess functional outcomes (speech and swallowing)
- To analyze cosmetic outcomes
- To document complications and donor-site morbidity
- To assess oncological safety

MATERIALS AND METHODS

Study Design

Prospective observational study conducted at Index Medical College, Indore from December 2024 to October 2025.

Sample Size

25 patients with biopsy-proven oral/oropharyngeal carcinoma.

Inclusion Criteria

- Age 20–80 years
- Suitable for SIF reconstruction
- No Level I nodal involvement

Exclusion Criteria

- Distant metastasis
- Prior surgery/radiation affecting flap
- Requirement of Level I clearance
- Severe comorbidities

Surgical Procedure

Tumor resection followed by harvesting of submental artery island flap and inset into defect.

Outcome Measures

- Flap viability
- Functional recovery
- Cosmetic satisfaction
- Complications
- Oncological outcomes

RESULTS

Results

Demographics

- Total patients: 25
- Mean age: 61 ± 7.3 years
- Male:Female = 17:8
- Common risk factor: Tobacco chewing (72%)

Tumor Distribution

- Tongue – 13
- Buccal mucosa – 7
- Floor of mouth – 3
- Lower alveolus – 2

Operative Details

- Mean operative time: 3.5 hours
- Flap size: Average 6×3 cm

Flap Outcomes

- Complete survival: 96%
- Partial necrosis: 4%
- No total flap loss (pie chart page 12)

Functional Outcomes

- Normal swallowing in all patients
- No aspiration
- Speech preserved in all patients

Complications

- Seroma/Hematoma: 16%
- Infection: 4%
- No nerve injury or donor morbidity

Cosmetic Outcomes

- Excellent: 84%
- Good: 8%
- Fair/Poor: 8%

Oncological Outcomes

- Negative margins in all cases
- No recurrence at 6–10 months follow-up

Table 1: Demographic Profile of Patients

Parameter	Value
Total Patients	25
Age Range	42–78 years
Mean Age	61 ± 7.3 years
Male : Female	17 : 8
Tobacco Chewing	72%
Smoking	56%

Hypertension	40%
Diabetes Mellitus	28%
COPD	12%
Ischemic Heart Disease	8%

Table 2: Distribution of Primary Tumor Sites

Site	Number of Patients
Tongue (Lateral Border)	13
Buccal Mucosa	7
Floor of Mouth	3
Lower Alveolus	2

Table 3: Types of Surgical Resection

Procedure	Number of Patients
Wide Local Excision	10
Partial Glossectomy	7
Wide Excision + Marginal Mandibulectomy	4
Wide Excision + Segmental Mandibulectomy	4

Table 4: Operative and Postoperative Outcomes

Parameter	Observation
Mean Operative Time	3.5 hours
Flap Size	Avg 6 × 3 cm
Oral Intake Start	POD 3-4
Soft Diet	By POD 7
Hospital Stay	Mean 6 days

Table 5: Flap Viability Outcomes

Outcome	Percentage
Complete Survival	96%
Partial Necrosis	4%
Total Flap Loss	0%

Table 6: Complications

Complication	Number	Percentage
Seroma/Hematoma	4	16%
Surgical Site Infection	1	4%
Wound Dehiscence	0	0%
Nerve Weakness	0	0%
Donor Site Morbidity	0	0%

Table 7: Cosmetic Outcomes

Outcome	Percentage
Excellent	84%
Good	8%
Fair	4%
Poor	4%



Figure 1: Preoperative marking of submental artery island flap in submental region.



Figure 2: Intraoperative harvesting of submental artery island flap showing pedicle preservation.

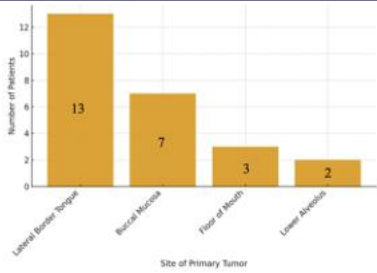


Figure 3: Distribution of primary tumor sites among study population.

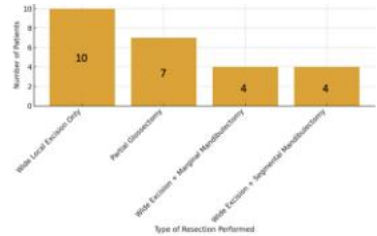


Figure 4: Types of surgical resections performed.

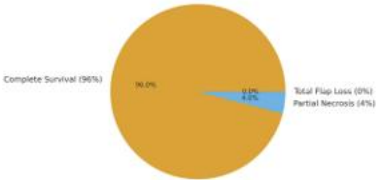


Figure 5: Flap viability outcomes (pie chart showing 96% survival).

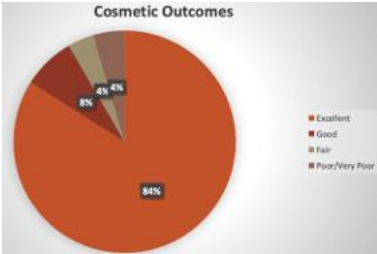


Figure 6: Cosmetic outcome distribution among patients.

DISCUSSION

This study demonstrates that the Submental Artery Island Flap is a highly reliable reconstructive option with a 96% survival rate.

Compared to free flaps:

- Shorter operative time
- Faster recovery
- Lower morbidity

Functional outcomes were excellent, with early return of speech and swallowing. Cosmetic outcomes were also highly satisfactory due to good tissue match and concealed scar.

Importantly, oncological safety was maintained when appropriate patient selection was ensured (no Level I nodal disease).

Limitations

- Small sample size (n=25)
- Short follow-up period
- Single-center study
- Hair growth issues in males

CONCLUSION

The Submental Artery Island Flap is:

- Safe and reliable
- Functionally effective
- Cosmetically superior
- A strong alternative to free flaps in resource-limited settings

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