

Original Research Article

RECONSTRUCTIVE PROPORTIONALITY IN HEMIGLOSSECTOMY: INDICATIONS AND OUTCOMES OF THE IPSILATERAL ISLANDED NASOLABIAL FLAP

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ABSTRACT

Background: Reconstruction following hemiglossectomy should restore tongue contour while preserving speech and swallowing. Although microvascular free flaps are the standard for extensive defects, moderate unilateral tongue defects may be effectively reconstructed using locoregional techniques. This study evaluated the outcomes of the ipsilateral islanded nasolabial flap for unilateral hemiglossectomy reconstruction.

Materials and Methods: An observational case series included 12 consecutive patients who underwent unilateral hemiglossectomy with immediate reconstruction using an ipsilateral islanded nasolabial flap between April 2023 and December 2025. Flap characteristics, operative time, hospital stay, postoperative complications, donor-site morbidity, and functional outcomes were evaluated. In the initial three patients, indocyanine green fluorescence angiography was used to confirm flap perfusion.

Results: Complete flap survival was achieved in all patients without partial or total flap necrosis. The mean flap size was **6.5 × 3.0 cm** (maximum **9 × 4 cm**). Mean flap harvest and inset time was **75 minutes**, and mean hospital stay was **8.5 days**. Minor complications included transient flap edema in two patients and superficial donor-site wound dehiscence in one patient, both managed conservatively. At a mean follow-up of **9.5 months**, all patients demonstrated intelligible speech, satisfactory swallowing, preserved oral competence, stable tongue contour, and no local recurrence or radiotherapy-related flap complications.

Conclusions: The ipsilateral islanded nasolabial flap is a reliable, safe, and proportionate reconstructive option for moderate unilateral hemiglossectomy defects, providing excellent functional outcomes, minimal donor-site morbidity, and efficient operative performance.

Keywords: Hemiglossectomy; Tongue reconstruction; Nasolabial flap; Islanded nasolabial flap; Oral squamous cell carcinoma.

INTRODUCTION

Squamous cell carcinoma (SCC) of the oral tongue is one of the most common malignancies of the oral cavity, and surgical resection remains the cornerstone of curative treatment. Depending on the stage and extent of disease, hemiglossectomy is frequently required to achieve oncologically

adequate margins while preserving as much residual tongue function as possible. Although oncological clearance is the primary objective, postoperative speech, swallowing, and oral competence largely depend on appropriate reconstruction of the resulting defect.^[1]

The tongue is a highly specialized muscular organ responsible for articulation, mastication, bolus propulsion, and airway protection. Consequently,

successful reconstruction extends beyond simple defect closure and requires restoration of adequate volume, contour, mobility, and mucosal lining. The reconstructive strategy should therefore be tailored not only to the size of the defect but also to the anticipated functional demands of the residual tongue.^[2]

Microvascular free tissue transfer has become the standard reconstructive option for extensive oral cavity defects because of its versatility and reliability. Free flaps such as the radial forearm free flap and anterolateral thigh flap provide excellent tissue availability for large composite defects and have demonstrated favorable long-term functional outcomes. However, these procedures require microsurgical expertise, prolonged operative time, specialized perioperative care, and increased healthcare resources, which may not always be necessary for moderate unilateral tongue defects.^[3]

Locoregional flaps continue to play an important role in carefully selected patients requiring reconstruction of limited to moderate oral cavity defects. Among these, the nasolabial flap remains an attractive option because of its robust vascularity, proximity to the oral cavity, thin and pliable tissue characteristics, and minimal donor-site morbidity. Based primarily on the facial artery vascular system, the flap can be harvested rapidly and transferred with excellent reliability while allowing primary donor-site closure with acceptable cosmetic outcomes.^[4]

The islanded modification of the nasolabial flap further expands its reconstructive versatility by eliminating the external skin bridge and increasing the arc of rotation. Transfer through a subcutaneous tunnel into the oral cavity permits single-stage reconstruction without the need for secondary pedicle division. Previous reports have demonstrated satisfactory flap survival and functional recovery in selected intraoral defects; however, published evidence remains limited to relatively small series, and clear indications for its use in hemiglossectomy reconstruction have not been well established.^[5,6]

An important principle in tongue reconstruction is reconstructive proportionality, whereby tissue replacement should correspond to the functional requirements of the defect rather than the maximum reconstructive capability available. Excessive tissue bulk may impair residual tongue mobility, whereas inadequate reconstruction compromises speech and swallowing. Therefore, selecting an appropriately proportioned flap is fundamental to achieving optimal functional rehabilitation while minimizing operative morbidity.^[7]

The present study evaluates the indications, surgical technique, vascular reliability, perioperative outcomes, and functional results of the ipsilateral islanded nasolabial flap for reconstruction following unilateral hemiglossectomy. We propose that, in appropriately selected patients with moderate unilateral tongue defects, this locoregional flap

represents a reliable and proportionate reconstructive option that restores tongue contour and function while avoiding unnecessary reconstructive escalation.

MATERIALS AND METHODS

Study Design and Ethical Considerations

An observational case series was conducted involving consecutive patients who underwent unilateral hemiglossectomy followed by immediate reconstruction using an ipsilateral islanded nasolabial flap at a tertiary-care centre between **April 2023 and December 2025**. Institutional Ethics Committee approval was obtained prior to commencement of the study. The investigation was conducted in accordance with the ethical principles of the Declaration of Helsinki and reported following established recommendations for observational surgical studies.^[8,9]

Patient Selection

Patients were included if they fulfilled the following criteria: (i) unilateral hemiglossectomy defects involving $\leq 50\%$ of the tongue, (ii) immediate primary reconstruction using an ipsilateral islanded nasolabial flap, and (iii) a minimum postoperative follow-up of 3 months. Patients requiring total glossectomy, bilateral tongue reconstruction, or those with previous irradiation of the ipsilateral cheek were excluded. Clinical, operative, reconstructive, pathological, and functional data were collected from institutional records.

Surgical Technique

Following oncologically adequate hemiglossectomy, the ipsilateral nasolabial flap was designed according to the dimensions of the tongue defect. The flap was elevated in the subcutaneous plane while incorporating a thin cuff of underlying mimetic muscle where necessary to protect the facial artery pedicle. After complete division of the cutaneous attachments, the flap was converted into an islanded adipocutaneous flap based on its vascular pedicle.^[10]

The flap was delivered inferiorly into the neck while remaining attached solely to its vascular pedicle, allowing confirmation of pedicle orientation and an unobstructed arc of rotation. A controlled tunnel was then created through the floor of the mouth, and the flap was transferred into the oral cavity with meticulous attention to avoid pedicle torsion, kinking, or compression. The flap was inset in a tension-free fashion to restore tongue contour while avoiding excessive tissue bulk that could compromise residual tongue mobility. The donor site was closed primarily in layers with preservation of the natural nasolabial crease.

Intraoperative Perfusion Assessment

In the initial three patients, intraoperative indocyanine green fluorescence angiography was performed following flap islanding and before definitive inset to objectively confirm flap

perfusion. Uniform fluorescence throughout the flap indicated satisfactory vascularity. As subsequent procedures consistently demonstrated satisfactory clinical perfusion, routine fluorescence angiography was not performed thereafter.^[11]

Outcome Measures

The primary outcome measure was complete flap survival. Secondary outcome measures included flap dimensions, operative time, duration of hospital stay, postoperative complications, donor-site morbidity, and functional recovery. Speech intelligibility, swallowing ability, oral competence, tongue mobility, and flap contour were evaluated during standardized postoperative follow-up. Flap viability, venous congestion, wound complications, donor-site healing, and the requirement for secondary surgical intervention were also documented.

Statistical Analysis

Continuous variables are presented as mean with range, whereas categorical variables are expressed

as frequencies and percentages. Statistical analysis was descriptive owing to the limited sample size.

RESULTS

Patient Characteristics

A total of 12 consecutive patients underwent unilateral hemiglossectomy followed by immediate reconstruction using an ipsilateral islanded nasolabial flap during the study period. The cohort comprised 9 males and 3 females, with a mean age of 54 years (range, 38–68 years). Histopathological examination confirmed oral tongue squamous cell carcinoma in all patients, and oncologically adequate surgical margins were achieved in every case. Nine patients underwent selective neck dissection, whereas three underwent modified radical neck dissection. Preservation of the facial artery was achieved in all planned flap reconstructions. The demographic and clinicopathological characteristics of the study population are summarized in Table 1.

Table 1: Patient Demographics and Clinicopathological Characteristics

Variable	Value
Total patients	12
Mean age (years)	54 (Range: 38–68)
Male	9 (75%)
Female	3 (25%)
Primary diagnosis	Oral tongue squamous cell carcinoma
Surgical procedure	Unilateral hemiglossectomy
Selective neck dissection	9 (75%)
Modified radical neck dissection	3 (25%)
Histopathologically negative surgical margins	12 (100%)
Adjuvant radiotherapy	8 (66.7%)

Flap Characteristics

The mean flap dimension was 6.5 × 3.0 cm, with flap lengths ranging from 5 to 9 cm and widths ranging from 2.5 to 4 cm. The largest flap harvested measured 9 × 4 cm, which adequately reconstructed the largest unilateral tongue defect while permitting

primary donor-site closure. No patient required secondary flap thinning or revision. Detailed flap characteristics are presented in Table 2. The operative sequence, including flap harvest and intraoral inset, is demonstrated in Figures 1 and 2.

Table 2: Defect Dimensions and Flap Characteristics

Parameter	Value
Reconstruction technique	Ipsilateral islanded nasolabial flap
Mean flap size	6.5 × 3.0 cm
Flap length	5–9 cm
Flap width	2.5–4 cm
Maximum flap size	9 × 4 cm
Facial artery preserved	12 (100%)
Primary donor-site closure	12 (100%)
Secondary flap thinning	0
Secondary flap revision	0



Figure 1: Hemiglossectomy Specimen Following Tumour Resection



Figure 2: Ipsilateral Islanded Nasolabial Flap Reconstruction

Table 3: Operative and Vascular Outcomes

Variable	Value
Mean flap harvest and inset time	75 min (Range: 60–95)
Mean hospital stay	8.5 days (Range: 7–12)
Complete flap survival	12 (100%)
Partial flap necrosis	0
Total flap necrosis	0
Venous congestion	0
ICG angiography performed	3 patients
Uniform ICG perfusion	3/3 (100%)
Re-exploration	0

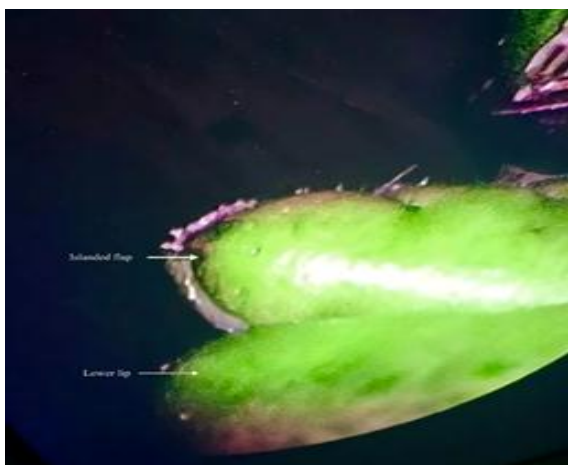


Figure 3: Intraoperative Indocyanine Green Fluorescence Angiography

Flap Survival and Vascular Outcomes

Complete flap survival was achieved in all 12 patients (100%), with no instances of partial or total flap necrosis. Venous congestion was not observed in any patient. In one patient, although the facial vein was absent within the flap territory, adequate venous drainage was maintained through the preserved venae comitantes without compromising flap viability. Intraoperative indocyanine green (ICG) fluorescence angiography was performed in the first three patients and demonstrated uniform flap perfusion before inset. As subsequent cases consistently demonstrated satisfactory clinical perfusion, routine ICG assessment was not continued. Vascular outcomes are summarized in Table 3, and representative ICG perfusion is shown in Figure 3.

Operative Outcomes

The mean operative time required for flap harvest and inset was 75 minutes (range, 60–95 minutes), while the mean duration of hospital stay was 8.5 days (range, 7–12 days). No patient required prolonged hospitalization because of flap-related complications. Operative parameters are summarized in Table 3, and a graphical representation is provided in Figure 4.

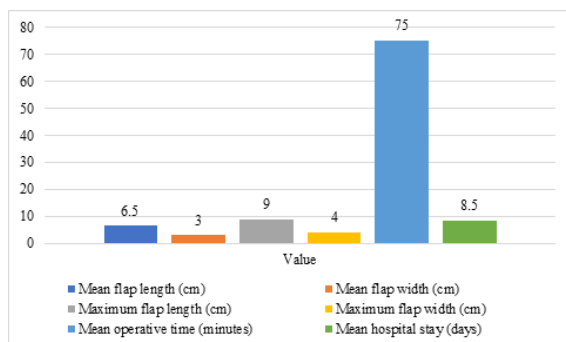


Figure 4: Operative Characteristics of the Ipsilateral Islanded Nasolabial Flap Reconstruction

Postoperative Complications

Postoperative morbidity was minimal. Two patients developed transient flap edema, which resolved with conservative management, and one patient experienced superficial donor-site wound dehiscence that healed without surgical intervention. No patient developed hematoma, infection, venous thrombosis, partial or complete flap loss, or required flap re-exploration or secondary reconstructive procedures. Postoperative complications are summarized in Table 4, and the overall clinical outcomes are illustrated in Figure 5.

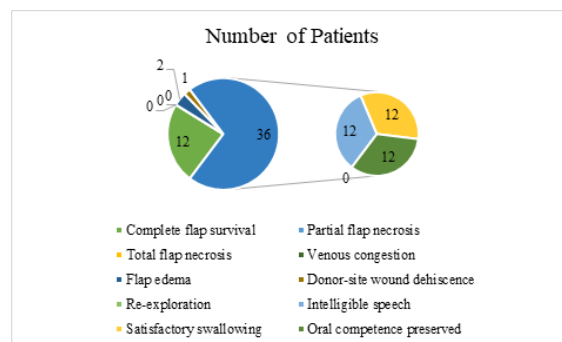


Figure 5: Postoperative Clinical Outcomes

Functional Outcomes

Oral feeding was initiated between postoperative days 10 and 14 in the majority of patients. The mean follow-up duration was 9.5 months (range, 6–12 months). At the 3-month follow-up, all patients achieved intelligible speech sufficient for routine interpersonal communication without dependence on compensatory articulation strategies. Swallowing function was satisfactory in all patients, with no clinically evident aspiration. Oral competence was preserved in every patient. Serial postoperative evaluation demonstrated stable tongue contour, satisfactory mucosal adaptation, preserved tongue mobility, and no evidence of flap contracture or the need for secondary debulking procedures. Representative postoperative outcomes at 3 months and 10 months are shown in Figures 6 and 7, while functional outcomes are summarized in Table 4.

Table 4: Functional Outcomes and Postoperative Complications

Outcome	Value
Oral intake initiated	POD 10–14
Mean follow-up	9.5 months (Range: 6–12)
Intelligible speech	12 (100%)
Satisfactory swallowing	12 (100%)
Clinically evident aspiration	0
Oral competence preserved	12 (100%)
Stable tongue contour	12 (100%)
Flap edema	2 (16.7%)
Donor-site wound dehiscence	1 (8.3%)
Infection	0
Hematoma	0
Flap loss	0
Local recurrence during follow-up	0
Radiotherapy-related flap complication	0
Functional limitation at donor site	0
Significant aesthetic dissatisfaction	0



Figure 6: Three-Month Postoperative Functional Outcome



Figure 7: Ten-Month Postoperative Functional Outcome

Oncological and Donor-Site Outcomes

No local recurrence was observed during the follow-up period. Based on multidisciplinary tumour board recommendations, eight patients received adjuvant radiotherapy, and no flap-related complications attributable to radiotherapy were encountered. Primary donor-site closure was achieved in all patients. The donor-site scars were well concealed within the nasolabial crease, and no patient reported functional limitation or significant aesthetic dissatisfaction.

DISCUSSION

Reconstruction following hemiglossectomy should restore tongue contour while preserving the residual mobility required for articulation, mastication, and swallowing. Although advances in microsurgical reconstruction have expanded the reconstructive armamentarium, the optimal reconstructive technique should be selected according to the size, location, and functional demands of the defect rather than the availability of increasingly complex procedures. The present case series demonstrates

that the ipsilateral islanded nasolabial flap provides reliable vascularity, satisfactory functional recovery, minimal donor-site morbidity, and excellent flap survival in appropriately selected unilateral hemiglossectomy defects.^[13]

The concept of reconstructive proportionality represents the principal finding of the present study. Moderate unilateral tongue defects do not necessarily require volumetric replacement with free tissue transfer. Instead, reconstruction should provide sufficient tissue to restore tongue contour while preserving the mobility of the remaining musculature. In the present series, flap dimensions were deliberately tailored to the size of the defect, with a mean flap size of 6.5×3.0 cm, thereby avoiding excessive bulk that could potentially impair speech and swallowing. The absence of secondary debulking procedures and the consistent functional outcomes observed during follow-up support the importance of proportionate tissue replacement.^[14]

Microvascular free flaps, particularly the radial forearm and anterolateral thigh flaps, remain the preferred reconstructive options for extensive oral tongue defects because they provide large volumes of well-vascularized tissue and permit three-dimensional reconstruction. However, these techniques require microsurgical expertise, longer operative times, specialized postoperative monitoring, and increased healthcare resources. In contrast, locoregional flaps remain valuable for carefully selected patients with moderate unilateral defects, offering shorter operative duration and reduced surgical morbidity without compromising functional recovery. The mean flap harvest and inset time of 75 minutes observed in the present series further supports the efficiency of this approach.^[15]

The nasolabial flap possesses several anatomical characteristics that make it particularly suitable for reconstruction of moderate tongue defects. Its robust vascular supply from the facial artery system, thin and pliable adipocutaneous tissue, and close proximity to the oral cavity facilitate reliable transfer with minimal donor-site morbidity. Conversion of the flap into an islanded design increases the arc of rotation and eliminates the need for staged pedicle division, allowing single-stage intraoral reconstruction. These technical advantages were reflected by the 100% flap survival rate, absence of venous congestion, and lack of flap-related re-exploration in the present series.^[16]

An additional strength of this study is the selective use of indocyanine green (ICG) fluorescence angiography during the initial cases. Objective confirmation of flap perfusion provided additional confidence during early adoption of the surgical technique and demonstrated uniform vascularity in every assessed flap. As clinical assessment consistently confirmed adequate perfusion in subsequent patients, routine ICG angiography was unnecessary. These findings suggest that fluorescence imaging may serve as a useful adjunct

during the learning phase of islanded nasolabial flap reconstruction rather than as an essential component of every procedure.^[17]

Functional restoration remains the primary objective of tongue reconstruction. In the present series, all patients achieved intelligible speech sufficient for routine interpersonal communication and satisfactory swallowing without clinically evident aspiration. Furthermore, serial postoperative evaluation demonstrated stable tongue contour, preserved residual mobility, and no requirement for secondary flap debulking. These observations indicate that restoration of appropriate tongue volume, rather than maximal tissue replacement, is sufficient to achieve satisfactory functional rehabilitation in carefully selected unilateral defects. Although standardized speech and swallowing assessment tools were not employed, the consistent clinical outcomes across all patients reinforce the functional reliability of this reconstructive approach.^[18]

The present study has several limitations. It represents a single-centre case series with a relatively small number of patients and lacks a comparative cohort reconstructed using microvascular free tissue transfer or alternative locoregional flaps. Functional outcomes were assessed clinically rather than by validated speech and swallowing instruments. Nevertheless, all procedures were performed using a standardized reconstructive technique with uniform postoperative assessment, providing a consistent evaluation of flap survival, donor-site morbidity, and functional recovery. Larger prospective comparative studies incorporating objective functional scoring and quality-of-life assessment are warranted to further define the role of the ipsilateral islanded nasolabial flap within contemporary tongue reconstruction.^[19]

In discussion, the findings of this case series support the ipsilateral islanded nasolabial flap as a dependable and proportionate reconstructive option for moderate unilateral hemiglossectomy defects. When applied within appropriate anatomical indications, the technique provides reliable vascularity, excellent flap survival, satisfactory speech and swallowing outcomes, minimal donor-site morbidity, and efficient operative performance while avoiding unnecessary reconstructive escalation.

CONCLUSION

The present case series demonstrates that the **ipsilateral islanded nasolabial flap** is a reliable, safe, and functionally effective reconstructive option for **moderate unilateral hemiglossectomy defects**. In appropriately selected patients, the flap provided **100% survival**, dependable vascularity, satisfactory speech and swallowing outcomes, minimal donor-site morbidity, and efficient operative performance with a mean flap harvest and inset time of **75 minutes**. The islanded design facilitates single-stage

reconstruction with an adequate arc of rotation while preserving tongue contour and residual mobility. These findings support the principle of **reconstructive proportionality**, whereby tissue replacement should be tailored to the functional requirements of the defect rather than routine escalation to more complex reconstructive procedures. Although larger comparative studies with standardized functional outcome measures are warranted, the ipsilateral islanded nasolabial flap represents a valuable locoregional reconstructive option for carefully selected unilateral hemiglossectomy defects.

Author Contributions

Dr Vinayak Chavan - Conceptualization, surgical procedures, data collection, manuscript drafting, and final approval.

Dr Basavaraj H - Data collection, manuscript drafting, data analysis

Dr Savitha A K - Data collection, manuscript drafting

Ethical Approval

This study was conducted in accordance with the principles of the Declaration of Helsinki. Institutional Ethics Committee approval was obtained prior to data collection.

Informed Consent

Written informed consent was obtained from all patients for surgical treatment and use of anonymized clinical photographs for academic and publication purposes.

Conflict of Interest

The authors declare no conflicts of interest related to this study.

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REFERENCES

1. Brown J, Bekiroglu F, Shaw R. Indications for the scapular flap in reconstructions of the head and neck. *British Journal of Oral and Maxillofacial Surgery*. 2010 Jul 1;48(5):331-7.
2. Shah JP, Patel SG, Singh B, Jatin Shah's head and neck surgery and oncology E-Book. Elsevier Health Sciences; 2012 Feb 5.
3. Grammatica A, Piazza C, Ferrari M, Verzeletti V, Paderno A, Mattavelli D, Schreiber A, Lombardi D, Fazio E, Gazzini L, Giorgetti G. Step-by-step cadaver dissection and surgical technique for compartmental tongue and floor of mouth resection. *Frontiers in oncology*. 2021 Apr 23;11:613945.
4. Rahpeyma A, Khajehahmadi S. The place of nasolabial flap in orofacial reconstruction: A review. *Annals of Medicine and Surgery*. 2016 Dec 1;12:79-87.
5. Mishra A, Shankar R, Prakash G, Banerjee S, Daga D, Birmiwal KG, Tiwari N, Gupta M, Sahu GC, Das A. Transposition nasolabial flap: A versatile flap for sensate reconstruction of lip defects. *Head & Neck*. 2022 Nov 1;44(11):2473.
6. Bali ZU, Ozkan B, Parspancı A, Kecici Y, Yoleri L. Reconstruction of lower lip defects with free super- thin anterolateral thigh flap. *Microsurgery*. 2021 Mar;41(3):216-22.
7. Wei FC. *Flaps and reconstructive surgery* 2nd edition.

8. Bibbins-Domingo K, Brubaker L, Curfman G. The 2024 revision to the Declaration of Helsinki: modern ethics for medical research. *Jama*. 2025 Jan 7;333(1):30-1.
9. Von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *The lancet*. 2007 Oct 20;370(9596):1453-7.
10. Rahpeyma A, Khajehahmadi S. The place of nasolabial flap in orofacial reconstruction: A review. *Annals of Medicine and Surgery*. 2016 Dec 1;12:79-87.
11. Moyer HR, Losken A. Predicting mastectomy skin flap necrosis with indocyanine green angiography: the gray area defined. *Plastic and reconstructive surgery*. 2012 May 1;129(5):1043-8.
12. Tassone P, Galloway T, Dooley L, Zitsch III R. Orocutaneous fistula after oral cavity resection and reconstruction: systematic review and meta-analysis. *Annals of Otolaryngology, Rhinology & Laryngology*. 2022 Aug;131(8):880-91.
13. Calabrese L, Fazio E, Bassani S, Abousiam M, Dallari V, Albi C, Nucera G, Nebiaj A, Zanghi F, Accorona R, Gazzini L. Systematic review of minimally-invasive reconstructive options for oral cavity defects. *Acta Otorhinolaryngologica Italica*. 2024 May 13;44(2 Suppl 1):S42.
14. Wei FC, Mardini S. Flaps and reconstructive surgery e-book: Flaps and reconstructive surgery e-book. Elsevier Health Sciences; 2016 Aug 26.
15. Chang EI, Yu P, Skoracki RJ, Liu J, Hanasono MM. Comprehensive analysis of functional outcomes and survival after microvascular reconstruction of glossectomy defects. *Annals of surgical oncology*. 2015 Sep;22(9):3061-9.
16. Accorona R, Di Furia D, Cremasco A, Gazzini L, Mevio N, Pilolli F, Achen A, Iftikhar H, Awany S, Ormellese GL, Dragonetti AG. Oral reconstruction with locoregional flaps after cancer ablation: a systematic review of the literature. *Journal of clinical medicine*. 2024 Jul 17;13(14):4181.
17. Munabi NC, Olorunnipa OB, Goltsman D, Rohde CH, Ascherman JA. The ability of intra-operative perfusion mapping with laser-assisted indocyanine green angiography to predict mastectomy flap necrosis in breast reconstruction: a prospective trial. *Journal of Plastic, Reconstructive & Aesthetic Surgery*. 2014 Apr 1;67(4):449-55.
18. Patel AA, Cheng A. The nasolabial flap. *Atlas of the Oral and Maxillofacial Surgery Clinics of North America*. 2020 Mar 1;28(1):7-12.
19. Khismatrao VN, Popat SP, Sharma P, Gupta A. Versatility of facial artery musculomucosal (FAMM) flap for reconstruction of oral cavity defects. *Journal of Maxillofacial and Oral Surgery*. 2023 Mar;22(Suppl 1):44-50.