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SYSTEMATIC REVIEW

CHARACTERIZING THE FUNCTIONAL AND COSMETIC OUTCOMES OF PEDICLED NECK FLAPS IN PATIENTS WHO UNDERWENT PARTIAL TONGUE RESECTION: A SYSTEMATIC REVIEW

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ABSTRACT

Introduction: Pedicled flaps from infrahyoid, pectoralis major, and trapezius were commonly used for partial tongue reconstruction. Not until a free radial forearm flap was introduced. The flap is recommended for patients with tongue defects ≤ 50% because of its thinness, pliability, and long pedicle. This systematic review explores the functional and cosmetic outcomes of pedicled flaps from the neck region for patients who underwent partial tongue resection or hemiglossectomy.

Method: A systematic literature searching was performed on PubMed, Medline, Scopus, Embase, and Cochrane. Keywords included were pedicled flap, neck flap, partial tongue resection, hemiglossectomy, and partial neck surgery. Inclusion and exclusion criteria were applied to the search results. Relevant studies were assessed for their methodological quality using appropriate instruments.

Results: Four hundred and twenty-four articles were obtained from the initial literature search. The authors finally gathered 11 full-text articles comparing the pedicled neck flaps with free flaps for partial tongue resection reconstructions. Pedicled neck flaps, such as submental, infrahyoid, sternocleidomastoid, and supraclavicular artery island flap, are clinically relevant for hemiglossectomy reconstruction with comparable functional and aesthetic outcomes.

Conclusion: Regional flaps would be a preferred technique in more difficult patients such as those with advanced age, poor nutrition, or multiple medical issues as they are not always acceptable surgical candidates for potentially prolonged microsurgery.

***Keyword**: Glossectomy; Surgical flaps; Treatment outcome.*

ABSTRAK

Pengantar: Jabir berpedikel dari infrahyoid, pectoralis mayor dan trapezius biasanya digunakan untuk rekonstruksi lidah parsial. Hingga sampai jabir bebas lengan bawah radial diperkenalkan, flap tersebut direkomendasikan untuk pasien dengan kelainan lidah ≤ 50% karena bentuknya yang tipis, lentur, dan pedikel yang panjang. Tinjauan sistematis ini mengeksplorasi hasil fungsional dan kosmetik dari jabir berpedikel dari daerah leher untuk pasien yang menjalani reseksi lidah parsial atau hemiglosektomi.

Metode Pencarian literatur sistematis dilakukan di PubMed, Medline, Scopus, Embase, dan Cochrane. Kata kunci yang digunakan adalah pedicled flap, neck flap, partial tongue resection, hemiglossectomy, dan partial neck surgery. Kriteria inklusi dan eksklusi diterapkan pada hasil pencarian. Studi yang relevan dinilai untuk kualitas metodologisnya dengan menggunakan instrumen yang sesuai.

Hasil: Empat ratus dua puluh empat artikel diperoleh dari pencarian literatur awal. Penulis akhirnya mengumpulkan 11 artikel teks lengkap yang membandingkan jabir leher berpedikel dengan jabir bebas untuk rekonstruksi reseksi lidah parsial. Jabir bebas berpedikel, seperti submental, infrahyoid, sternokleidomastoid, dan jabir arteri supraklavikular, secara klinis relevan untuk rekonstruksi hemiglosektomi dengan hasil fungsional dan estetika yang sebanding.

Kesimpulan: Jabir regional akan menjadi teknik yang lebih baik untuk dipilih pada pasien sulit seperti pasien dengan usia lanjut, gizi buruk, atau masalah medis ganda karena tidak selalu dapat diterima sebagai kandidat bedah untuk kemungkinan bedah mikro berkepanjangan.

***Kata kunci:** Glossektomi; Flap bedah; Hasil pengobatan.*

Conflicts of Interest Statement:
The author(s) listed in this manuscript declare the absence of any conflict of interest on the subject matter or materials discussed.

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INTRODUCTION

The tongue is a highly specialized organ with many vital functions, including talking and swallowing. Performing a glossectomy presents a wide array of challenges for reconstruction. Glossectomy itself can be classified into several groups based on the defect:[1] a. Partial oral glossectomy for a defect to 1/3 or less of the tongue, b. Oral hemiglossectomy for a defect to 1/3 or 1/2 of the tongue, c. Near-total oral glossectomy for a defect to 1/2 or 3/4 of the tongue, d. Total oral glossectomy for a defect to 3/4 or total of the tongue.

There are several choices of flaps for tongue reconstruction. In the past, there were several pedicled flaps commonly used, such as the infrahyoid myofascial, pectoralis major myocutaneous, or the trapezius islanded pedicle flap. Over time, more regional and free flap transfer was introduced to address the reconstruction of extensive head and neck defects, especially after a wide resection in patients with advanced-stage cancers. Some examples of these flaps are radial forearm free flap (RFF), free anterolateral thigh flap (ALT), and medial sural artery perforator free flap (MSAP). Free radial forearm flap has been a recommendation for patients with defect ≤ 50% because of its thinness, pliability, and long pedicle.[2]

However, various other current data discussed the effectiveness of tongue defect reconstruction using various types of pedicled flaps from the neck area. These pedicled flaps include submental, sternocleidomastoid, and supraclavicular island flap arteries flap. Several studies have shown that these flaps had functional and cosmetic outcomes similar to free tissue flaps in patients undergoing partial tongue resection.[3,4] Meanwhile, some opinions also stated that these flaps were not necessarily reliable because they could provide high early post-surgery complications, such as flap loss and skin necrosis.[5,6]

With these various sources regarding reconstruction on partial tongue resection and hemiglossectomy, we wondered whether pedicled flaps from the neck region could be an alternative to free radial flap, which has been the standard reference. Thus, this systematic review aimed to compile all available evidence regarding the outcomes of pedicled neck flaps in patients who underwent partial tongue resection or hemiglossectomy to characterize their functional and cosmetic outcomes.

METHOD

Study Selection

A comprehensive literature searching was done on January 12, 2019, using electronic databases PubMed, Medline, Scopus, Embase, and Cochrane with keywords including *glossectomy, surgical flaps,* and *treatment outcome.* **(Table 1)**

Based on the used keywords, 424 articles were obtained from the databases. Then the studies were filtered to avoid doubles. Searching was proceeded using inclusion criteria: (1) Randomized controlled trials, cohort studies, and case reports; (2) Adults patients; (3) Underwent partial glossectomy or hemiglossectomy surgery; (4) Had pedicled neck flaps to cover the defect. Pedicled neck flaps in this review are referred to any pedicled flaps that involved body organs in the cervical region, joining the head to the shoulders, located below the mandible and above the clavicle's manubrium. Meanwhile, studies were excluded in this report when they met the following criteria: (1) Systematic review and meta-analysis; (2) Articles in languages other than English; (3) Had pedicled flaps involving organs above the mandible and below the clavicles and manubrium. All retrieved articles were checked for the availability of the English full-texts, relevance to clinical questions. and assessed for their methodological quality. The algorithm for our search strategy can be seen in **Figure 1**.

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Table 1. Keywords Search in Databases

Database	Key Words	Hits	Selection	Access Date
PubMed	((("surgical flaps"[MeSH Terms] OR ("surgical"[All Fields] AND "flaps"[All Fields]) OR "surgical flaps"[All Fields] OR ("pedicled"[All Fields] AND "flap"[All Fields]) OR "pedicled flap"[All Fields]) OR (infrahyoid[All Fields] AND ("surgical flaps"[MeSH Terms] OR ("surgical"[All Fields] AND "flaps"[All Fields]) OR "surgical flaps"[All Fields] OR "flap"[All Fields]))) OR (("neck"[MeSH Terms] OR "neck"[All Fields]) AND ("surgical flaps"[MeSH Terms] OR ("surgical"[All Fields] AND "flaps"[All Fields]) OR "surgical flaps"[All Fields] OR "flap"[All Fields]))) AND ((hemiglossectomy[All Fields] OR (partial[All Fields] AND ("tongue"[MeSH Terms] OR "tongue"[All Fields]) AND resection[All Fields])) OR (partial[All Fields] AND ("tongue"[MeSH Terms] OR "tongue"[All Fields]) AND ("surgery"[Subheading] OR "surgery"[All Fields] OR "surgical procedures, operative"[MeSH Terms] OR ("surgical"[All Fields] AND "procedures"[All Fields] AND "operative"[All Fields]) OR "operative surgical procedures"[All Fields] OR "surgery"[All Fields] OR "general surgery"[MeSH Terms] OR ("general"[All Fields] AND "surgery"[All Fields]) OR "general surgery"[All Fields]))))	251	6	January 12th 2019
Medline	((((pedicled flap) OR infrahyoid flap) OR neck flap)) AND (((hemiglossectomy) OR partial tongue resection) OR partial tongue surgery)			January 13 4 12th 2019
Scopus	((TITLE-ABS-KEY (pedicled AND flap) OR TITLE-ABS-KEY (infrahyoid AND flap) OR TITLE-ABS-KEY (neck AND flap))) AND ((TITLE-ABS-KEY (hemiglossectomy) OR TITLE-ABS-KEY (partial AND tongue AND resection) OR TITLE-ABS-KEY (partial AND tongue AND surgery)))	152		January 8 12th, 2019
Embase	((((pedicled flap) OR infrahyoid flap) OR neck flap)) AND (((hemiglossectomy) OR partial tongue resection) OR partial tongue surgery)			January 3 1 12th 2019
Cochrane	(pedicled flap) OR (infrahyoid flap) OR (neck flap) in Title Abstract Keyword AND (hemiglossectomy) OR (partial tongue resection) OR (partial tongue surgery) in Title Abstract Keyword			January 5 1 12th 2019

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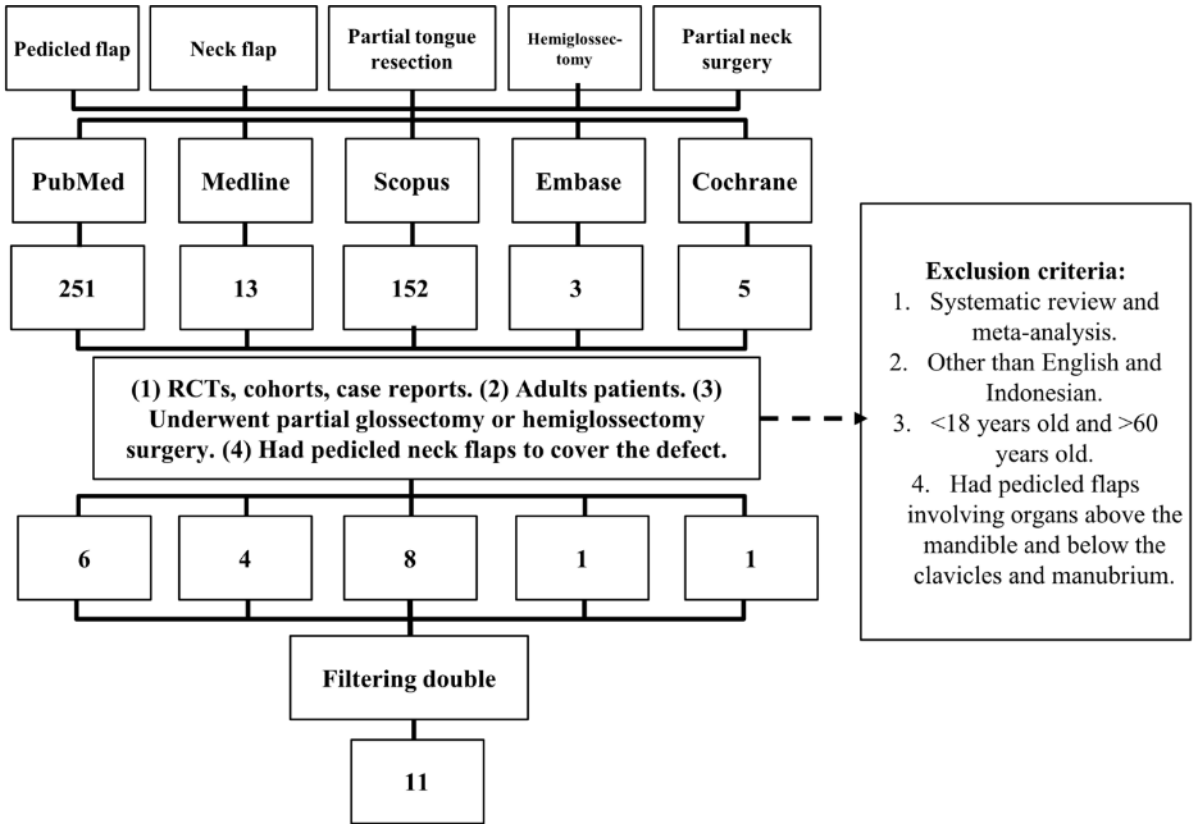

Figure 1. Search Strategy

RESULTS

The final 11 studies were considered for review. Nine works of literature were included as cohort studies, and 2 were case reports. Cohort studies were considered to have good quality when there are 3 or 4 stars in the selection domain AND 1 or 2 stars in the comparability domain AND 2 or 3 stars in the outcome/exposure domain. A case report was considered high quality when the total score is above 5.

Cohort studies were critically appraised with the Newcastle-Ottawa Quality Assessment. The study by Amin A, et al., Cariati P, et al., Cossio P, et al., Giordano L, et al., Golabek W, et al., Zhang S, et al., and Zhao Y, et al. were counted as high quality based on the rating. Meanwhile, the study by Kumar V et al. and Remmert S et al. are thought to have acceptable quality. A study by Kumar V et al. did not provide any information regarding the duration of follow-up or the number of lost patients to follow up. A study by Remmert S et al. has 0 stars in the comparability domain by not controlling other factors that might confound factors.

Quality appraisal for case report used JBI Critical Appraisal Checklist for Case Reports. Hanna T et al. provided high-quality case reports, in which one study missed to include the course of the patient's disease, and the other one did not describe the used assessment method to diagnose the condition of the patient. A study by Avery C et al. was considered low quality due to its inability to show the history and current clinical condition of each patient and not stating the diagnostic approach that made the patients involved in the study and the post-intervention clinical condition.

Characteristics of the included articles, along with each sample size, intervention and control group, outcome measure, and final finding, can be seen in **Table 2.**

DISCUSSION

Works of literature related to neck flaps with aesthetic and functional outcomes varying wildly. The types of studies that have been made vary from cohort and case reports. There are different sides of the cervical myocutaneous flaps

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from the included literature, such as submental, infrahyoid, sternocleidomastoid, supraclavicular artery, and platysma flaps.[3,4,5,6,7] The techniques used also consisted of island flap, which is a flap consisting of skin and subcutaneous tissue, with a pedicle made up of only the nutrient vessels, as well as a compound flap, which is a flap containing two or more tissue elements, usually skin, muscle, bone, or cartilage.[8,9] However, there is only 1 study by Zhang S, which was carried out comparisons for free radial for flaps, which was pedicled with island flap artery. Another study compares sensitive subjects by Golabek W et al. that compared island flap of sternocleidomastoid muscle with performing a compound flap.[6]

Out of 11 included articles, the highest level of evidence and quality assessment score is written by Golabek W, et al. This study observed 22 patients with oral cancer, with a range of tongue and underwent surgical procedures, including partial tongue resection. Five patients in the study underwent sternocleidomastoid island myocutaneous flap and rested under compound myocutaneous flap. Patients were then followed up one week and two months after surgery. Skin necrosis, healing, and functional muscle outcomes consisting of swallowing and speech were analyzed. All patients generally have no swallowing problems. Six patients developed slight speech defects. Meanwhile, 40% of the island flap group patients had total skin necrosis and partial necrosis each during follow-up.[5]

The infrahyoid flap was one of the most preferred flaps for hemiglossectomy defects in the past. According to Windfuhr JP et al. in 2006, the flap was contributed to by reducing the time needed for surgery and postoperative morbidity and reducing associated health costs.[2] A study by Remmert S et al. published in 1996 was able to exhibit the contraction of the tongue through M-mode ultrasound and function of the reconstructed tongue through cine fluoroscopy. All patients had a good function of the reconstructed tongue postoperatively, including touching the palate of the mouth with their "new" tongue. Myocutaenous flap performed excellent oral swallowing and reintegrated into their usual diet with difficulty in every 3-month follow-up. Nevertheless, the average of the outcomes of the VAS score of 3, which might be defined as "unacceptable" based on the VAS criteria for an aesthetic appearance by Celik EU et al. One patient experienced a small intraoral hairy area after the surgery.[10] Meanwhile, Zhao Y et al. assessed different exposures in their studies, including infrahyoid, sternocleidomastoid, and platysma flaps. After six months of follow-up, two patients with infrahyoid flaps had total skin loss and partial skin loss. However, the rate of success was higher when compared with the sternocleidomastoid and platysma flaps. After all, these results may be related to the subjects used by each of the various studies, including stage 3 and 4 cancers that might require wider resection.[7]

There is 1 study by Golabek W et al., who tried to compare five patients who performed the sternocleidomastoid island myocutaneous flap with 17 patients who performed the sternocleidomastoid compound myocutaneous flap. Overall, it was found that all patients had an excellent swallow function. However, changes in speech were found in 15 patients in total. All patients in the island flap group had good muscle healing and found five patients in the compound flap group to have good muscle healing. Meanwhile, this could not conclude the comparison between the two because the initial number of each subject was very different.[5] Kumar W et al. conducted a study of the sternocleidomastoid island flap and obtained good final cosmesis in all research subjects. Only from 32 included patients, 16 patients had flap complications, especially in early complications, such as flap loss, skin paddle loss, and partial skin loss. The Authors considered the sternocleidomastoid myocutaneous flap as a non-reliable but straight flap due to its segmental supply and higher flap loss rate. This might be associated with when a superior artery pedicle flap is used. The skin island in the distal portion is prone to total or partial necrosis or ischemia, or fistula formation because of inadequate blood supply.[11] When compared with infrahyoid and platysma flaps, the sternocleidomastoid flap had the lowest score of 89.4%.[7] Sternocleidomastoid flap would have been more effective for repairing small to medium-sized defects of the lower oral cavity, especially in patients compromised by previous treatment or comorbidity, as suggested by Avery C et al.[12]

Meanwhile, the submental flap had satisfactory cosmesis at the donor site in patients with partial tongue resection or hemiglossectomy. All patients had speech and

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swallowing functions. Tongue mobility and functions of all subjects were excellent.[3,13,14] Nevertheless, in a total of 2 studies consisting of patients with partial tongue resection due to oral cavity cancers, one patient suffered from restricted tongue mobility and tethering following flap reconstruction of a tongue defect patient T2N0 stage had a local relapse. One patient with T3N0 and T2N1 stage had a cervical relapse.[13] Amin A et al. suggested that a submental artery flap is a more valid option for the reconstruction of small to moderate-sized soft tissue and composite oral cavity defects. It represents a reasonable alternative to free flaps, particularly in elderly patients. This flap should not be conducted in those patients with clinically advanced nodal disease in the neck (> N1). [3]

From all the included literature, Zhang S et al. is the only one to assess the free radial forearm flap as a comparison. This study examined the 27 patients with anterior lateral tongue carcinoma who underwent surgical resections and covered the defect with pedicled supraclavicular artery island and free radial forearm flaps. The supraclavicular artery flap included in this study was related to the flap type bleeding source, which originated from the supraclavicular artery originating from the cervical region and according to the inclusion criteria listed. This study stated that 91.7% of patients who underwent pedicled supraclavicular artery flap achieved an excellent outcome in speech function, 83.3% of patients had a function of swallowing that was good with a full oral diet, and no patient experienced complete flap loss. Whereas 80.0% of patients who performed free radial forearm flap had excellent speech function, 86.7% had good swallowing function on a complete oral diet and found 6.7% of subjects had complete flap loss.[6] All patients with a range of ages from 55-80 years old who underwent hemiglossectomy and were reconstructed with a supraclavicular artery island flap in the study by Giordano L, et al. showed perfect color and texture match. The pedicled supraclavicular artery flap could offer a regional flap alternative with comparable functional outcomes and minimal donor site morbidity.[15]

Overall, all pedicled neck flaps have satisfactory cosmetic results for all patients, except for infrahyoid flaps performed in patients with advanced oropharyngeal squamous cells cancer stage 3 and 4 who had a wider resection of the tongue. The sternocleidomastoid muscle flap was considered less reliable due to its high early complication produced in patients who performed tongue resection and would have been more effective for repairing small to medium-sized defects of the lower oral cavity. A study also recommended submental artery flap as a more authentic option for reconstructing small to moderate soft tissue defects. Moreover, the research comparing pedicled supraclavicular artery flap with free radial forearm flap exhibited that pedicled supraclavicular artery flap could act as a flap alternative. The qualities of ideal soft-tissue flap for head and neck reconstruction can be defined as its versatility in design, sufficient stock of the tissue, prime texture, minimal morbidity in the donor site, availability of diverse tissue types on one pedicle, the potential for re-innervation, large and long pedicle, and consistent anatomy for easy and safe harvesting.

In contrast with free radial forearm flap, regional flaps would be a preferred technique in more difficult patients such as advanced age, poor nutrition, or multiple medical issues. They are not always acceptable surgical candidates for potentially prolonged microsurgery. Patients with clinically nodal enlargement from the underlying disease should not undergo pedicled neck flaps.[3-7, 10-5] The authors attempted to summarize the outcomes of the pedicled neck flaps on partial tongue reconstruction in **Table 3**.

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Table 2. Characteristics of Included Studies

Article	Levels	Participants and Sample Size	Intervention Group	Control Group	Outcome Measures	Results
Cohort Studies						
Amin A, et al. (2011)	2b	21 patients diagnosed with oral cavity cancers for over three years with a range of ages from 32-83 years old who underwent surgical resection, including partial tongue resection	Immediate submental island myocutaneous flap		Cosmetic and functional results (follow-up period: 3-44 months)	– **Cosmetic and functional outcome**, including speech and swallowing, was good in all patients
Cariati P, et al. (2018)	2b	Nine patients with a mean age of 59.6 years old diagnosed with oral squamous cell carcinoma underwent partial tongue resection.	Submental island myocutaneous flap	-	Relapse, the functionality of reconstruction, and aesthetic outcomes (follow-up: 9 months postoperatively)	– **Functional outcome**: All patients had adequate results – **Cosmetic outcome**: All patients had adequate results
Cossio P, et al. (2016)	2b	Six patients with a mean age of 59.85 years old diagnosed with advanced oropharyngeal squamous cells cancer stage 3 and 4 who underwent partial oropharyngectomy, palatectomy, glossectomy	Infrahyoid island myocutaneous flap	-	Cosmetic and functional results (mean follow-up: 63.25 months)	– **Functional outcome**: All patients had excellent oral swallowing and reintegrated into their usual diet without difficulty. – **Cosmetic outcome**: One patient had a small intraoral hairy area and disappeared after post-op radiotherapy.
Giordano L, et al. (2016)	2b	14 patients diagnosed with head and neck malignancies with a range of ages from 55-80 years old who underwent surgical resection, including hemiglossectomy	Supraclavicular artery island flap	-	Cosmetic and functional results (follow-up period: 2-26 months)	– **Functional outcome**: 12 patients had excellent functional outcomes – **Cosmetic outcome:** Skin reconstruction of 12 patients showed perfect color and texture match
Golabek W, et al. (1989)	2b	22 patients with oral cavity cancers with a range of ages from 38-80 years old who underwent surgical resection, including partial tongue resection	Five patients who underwent sternocleidomastoid island myocutaneous flap	17 patients who underwent sternocleidomastoid compound myocutaneous flap	Skin necrosis, muscle healing, and functional results (follow-up: 1 week and two months postoperatively)	– **Functional outcome:** Six patients had distinct deterioration of speech, and nine patients developed slight speech defect
Kumar V, et al. (2009)	2b	32 patients with oral cavity cancers who underwent surgical resection, including partial tongue resection	Sternocleidomastoid island myocutaneous flap	-	Flap complications and cosmetic outcome	– **Cosmetic outcome:** All patients had good final cosmesis

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Article	Levels	Participants and Sample Size	Intervention Group	Control Group	Outcome Measures	Results
Remmert S, et al. (1996)	2b	Seven patients with tongue cancers who underwent partial tongue resections	Neurovascular fasciomuscular island flap derived from infrahyoid muscle unilaterally.	-	Contractions of transplanted muscle through M-mode ultrasound and function of the reconstructed tongue through cine fluoroscopy	– **Functional outcome:** Contractions of the transplanted muscle are visible. Through cine fluoroscopy, the patient showed excellent function of the reconstructed tongue.
Zhang S, et al. (2015)	2b	27 patients with anterior lateral tongue carcinoma who underwent surgical resection of the tumors	12 patients underwent reconstruction of the resultant defects with the pedicled supraclavicular artery island flap (PSAIF)	15 patients underwent reconstruction of the resultant defects with the free radial forearm flap (FRFF)	Swallowing function and speech intelligibility (follow-up: 6 months postoperatively)	– **PSAIF group:** 91.7% of patients achieving an excellent outcome in speech function. 83.3% had good swallowing function on a complete oral diet. – **FRFF group:** 80% of patients achieving an excellent outcome in speech function. 86.7% had good swallowing function on a complete oral diet.
Zhao Y, et al. (2001)	2b	131 patients with oral cancers who underwent surgical resection, including partial tongue resection	Cervical island myocutaneous flap (Infrahyoid myocutaneous flaps were used in 53 cases, sternocleidomastoid flaps in 47 cases, and platysma flaps in 31 cases)	-	The rate of success of each type of flaps counted according to the incidence of skin loss, necrosis, postoperative dehiscence of the neck skin incisions, and abscesses that occurred postoperatively (follow-up: 6 months postoperatively)	– **Sternocleidomastoid myocutaneous flap:** The rate of success was 89.4% – **Infrahyoid myocutaneous flap:** The rate of success was 92.5% – **Platysma flap:** Rate of success was 90.3%
Case Report						

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Article	Levels	Participants and Sample Size	Intervention Group	Control Group	Outcome Measures	Results
Avery C, et al. (2011)	5	Four patients who underwent partial tongue resections	Conventional pedicled sternocleidomastoid flap based on the perforating vessels of the superior thyroid vascular pedicle	-	Effectivity to repair of minor to medium-sized defects of the lower oral cavity	- **Effectivity outcome:** Sternocleidomastoid flap was effective for repair of small to medium-sized defects of the lower oral cavity, especially in patients compromised by previous treatment or comorbidity
Hanna T, et al. (2015)	5	A 28-year older woman with T4aN0M0 biopsy-proved squamous cell carcinoma of the left lateral tongue underwent hemiglossectomy.	Submental island myocutaneous flap	-	Cosmetic and functional outcome (follow-up: 9 months postoperativel y)	- **Functional outcome:** Excellent tongue mobility and function - **Cosmetic outcome:** Satisfactory cosmesis at the submental donor site

Table 3. Summary of Pedicled Neck Flaps Outcomes

Pedicled Flaps	Functional Outcome		Cosmetic Outcome		Drawbacks	References
Infrahyoid	**Good**	Good tongue contraction and excellent oral swallowing	**Poor**	One case exhibited a small intraoral hairy area	Total and partial skin loss (6 months of follow-up)	Remmert S, et al (1996), Cossio P, et al (2016), Zhao Y, et al (2001)
Sternocleidomastoid	**Good**	Good swallowing function	**Good**		Early complications (i.e., flap loss, skin paddle loss, and partial skin loss) and trismus	Golabek W, et al. (1989), Kumar W, et al. (2009), Avery C, et al. (2011)
Submental	**Good**	Good speech and swallowing function	**Good**		Restricted tongue mobility and tethering in wider resection	Amin A, et al (2011), Cariati P, et al (2018), Hanna T, et al (2015)
Supraclavicular artery pedicled	**Good**	Good speech and swallowing function	**Good**	Perfect color and texture match	Partial flap loss in 2/12 patients	Giordano L, et al (2016), Zhang S, et al (2015)

Nevertheless, this review alone still has some limitations. There are also few studies having confounding variables, which might influence the result. Because the sizes of defects listed by the included studies vary, some types of pedicled neck flaps could produce proportional results when associated with free radial forearm flaps and showed lesser complications in small-

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moderate defects, especially in patients partial tongue resection and hemiglossectomy.

Overall, pedicled neck flaps are clinically relevant for partial tongue resection and hemiglossectomy with comparable functional and aesthetic outcomes. Regional flaps can be used in patients with advanced ages, poor nutrition, or multiple medical issues. [3-7] Patients with clinically nodal enlargement from the underlying disease should not undergo the pedicled neck flaps. [10-5].

CONCLUSION

Regional flaps would be a preferred technique in more difficult patients such as those with advanced age, poor nutrition, or multiple medical issues as they are not always acceptable surgical candidates for potentially prolonged microsurgery. Patients with clinically nodal enlargement from the underlying disease should not undergo pedicled neck flaps.

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