Comparison of Quality of Life in Tongue Cancer Patients Following Various Glossectomy Reconstructive Techniques

CRYSTAL LU,[1] MSN, APRN, FNP-BC, ASHLEY MARTINEZ,[1] DNP, APRN, FNP-BC, AOCNP®, CBCN, CPHQ, NEA-BC, NPD-BC, and JOYCE DAINS,[1] DrPH, JD, RN, FNP-BC, FNAP, FAANP, FAAN

From The University of Texas MD Anderson Cancer Center, Houston, Texas

Authors' disclosures of conflicts of interest are found at the end of this article.

Correspondence to: Crystal Lu, MSN, APRN, FNP-BC, University of Texas MD Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, TX 77030

E-mail: clu3@mdanderson.org

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Abstract

Tongue cancer treatment often involves glossectomy and flap reconstruction. Since the tongue plays a vital role in swallowing, chewing, speaking, airway protection, and taste, it also plays a major role in the patient's quality of life (QOL) after reconstruction. Therefore, the flap that best preserves QOL should be determined. A literature review was conducted using PubMed, Scopus, and Ovid MEDLINE, with a total of 446 articles retrieved. Four studies were included in this integrative review, which all utilized the University of Washington Quality of Life questionnaire to assess QOL in tongue cancer patients post-glossectomy and flap reconstruction. The articles specifically compared radial forearm free flap to pectoralis major myocutaneous flap, submental island pedicled flap, anterolateral thigh flap, and lateral upper forearm flap. Based on the included articles, no flap significantly preserved QOL. However, a certain flap may be more suitable for a patient based on the patient's preferences, lifestyle, health status, and goals. Therefore, it is important for providers to complete a thorough history and assessment prior to surgery so that the flap chosen upholds the patient's goals and preserves overall QOL.

The tongue is a vital and mobile muscular organ that plays a role in speech, taste sensation, swallowing, mastication, oral hygiene, and airway protection (Sakr, 2022; Zhang et al., 2018). It is also the most common site of intraoral cancer, with tongue squamous cell carcinoma being the most common oral malignancy (Zhang et al., 2020; Zhang et al., 2018). Risk factors for tongue cancer include age, tobacco use, and alcohol use (Sakr, 2022). Diagnosis, staging, and treatment planning can be obtained via an incisional or punch biopsy of evident tongue lesions or sentinel lymph node biopsy (Mohamad et al., 2023). The primary treatment modalities

are surgery and adjuvant radiation, with additional concurrent chemotherapy and radiation therapy for more advanced diseases (Mohamad et al., 2023). Surgical intervention typically includes a degree of glossectomy, or tongue tumor resection, neck dissection due to the high risk of cervical lymph node metastasis, and reconstruction (Liang et al., 2015; Sakr, 2022). For moderate-to-severe tongue defects, immediate, safe, and effective free flap tongue reconstruction is necessary to obtain and preserve tongue function and quality of life (QOL; Liang et al., 2015; Sakr, 2022; Zhang et al., 2018).

There are several free flap options available, including radial forearm free flap (RFFF), anterolateral thigh flap (ALTF), pectoralis major myocutaneous flap (PMMF), submental island pedicled (SIP), and lateral upper arm free flap (LUFF; Ferneini et al., 2022; Sakr, 2022). Radial forearm free flap and ALTF are the most commonly used microvascular fasciocutaneous free flaps that utilize a donor vessel in the neck (Ferneini et al., 2022). Submental island pedicled and PMMF are regional flaps used for tongue reconstruction when free tissue transfer is contraindicated (Sakr, 2022). Since these flaps will not provide complete tongue restoration, clinicians must be aware of all flap options that will provide optimal QOL for the patient.

Quality of life is a multifaceted concept that incorporates an individual's perception, personal beliefs, culture, values, goals, health and well-being, relationships, expectations, and concerns (Haraldstad et al., 2019; Kassianos, 2022). This is then evaluated with QOL tools that help measure the difference between the individual's expectations and reality of an experience and assist in identifying any patient concerns (Haraldstad et al., 2019; Kassianos, 2022). For head and neck cancer, the first published and most often used QOL questionnaire and measurement is the University of Washington Quality of Life (UW-QOL) questionnaire (Li et al., 2016; Rogers et al., 2010). This is a short, structured, comprehensive, easy to administer, and easy to complete questionnaire (Li et al., 2016; Mehanna et al., 2023; Rogers et al., 2010). Version 4.0 includes 12 domains: pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder function, taste, saliva, anxiety, and mood (Rogers et al., 2010). The domains are scored from 0 (the worst) to 100 (the best) and averaged with higher scores correlating with higher QOL (Mehanna et al., 2023; Zhang et al., 2018).

Since its introduction in the 1980s, RFFF has become one of the most widely used and longest-established flaps for reconstruction (Ferneini et al., 2022). Its consistent and large vascular anatomy, hairlessness, easy harvest, malleability, and minimal bulk allowed it to quickly succeed its bulky predecessor, the pectoralis flap (Costantino et al., 2023; de Bree et al., 2008; Ferneini et al., 2022; Shimada et al., 2022). This integrative review compares the QOL impact in tongue cancer patients who received RFFF compared with other specified flaps, the strengths and weaknesses of each reconstruction, and the advanced practice provider's (APP's) role in aiding patient education and flap choice.

METHODS

A literature search was conducted in January 2024 using PubMed, Scopus, and Ovid MEDLINE.

Keywords included "head cancer," "cancer neck," "head AND neck cancer," "head and neck neoplasm," "oral cancer," "tongue cancer," "tongue AND cancer," "tongue neoplasm," "cancer AND of AND the AND head AND neck," "tumor," "malignan," "oncol," "tumor OR malignan OR oncol," "distress," "stress," "depression," "anxiety," "quality of life," "free flap," "tissue flap," "fibular flap," "flap reconstruction," "microvascular," and "microsurg." Inclusion criteria specified English-language publications on QOL in patients with a tongue cancer diagnosis who had undergone free flap surgical procedure. No criteria were placed on publication dates and participants' age. A total of 446 articles were retrieved. After removing duplicates (n = 150), 296 articles were selected for title and abstract screening, resulting in additional exclusions (n = 273). Articles were excluded if they did not discuss tongue cancer, QOL measures, and free flap. Full-text screening was completed on 23 articles, with three excluded due to inability for retrieval. Articles not available in English (n = 2), absence of free flap discussion (n = 6), and absence of RFFF inclusion (n = 8) served as the final exclusion criteria, with four articles selected for analysis (Figure 1).

RESULTS

All articles included used UW-QOL version 4.0 as a measurement comparing QOL between RFFF and other flaps. The UW-QOL's 12 domains (pain, appearance, activity, recreation, chewing, swallowing, speech, shoulder function, saliva, taste, mood, and anxiety) served as the organizing framework for the results (Li et al., 2016; Rogers et al., 2010). Each domain was scored from zero (worst) to 100 (best) and averaged, with higher scores indicating better QOL (Tables 1 and 2; Rogers et al., 2010).

Pain

From July 2005 to October 2013, Li et al. (2016) compared patients who were treated at Zhengzhou University and received RFFF (n = 24) or PMMF (n = 17). The RFFF group consisted of 17 males and seven females. The PMMF group consisted of 17 males only. The median age of the participants was 53.5 years (p = NS). All participants completed the UW-QOL questionnaire after reconstruction via mail (range = 13–108 months). Scores are reported in Table 2.

From January 2010 to December 2017, Zhang et al. (2020) compared patients at The China Medical University who received RFFF (n = 83) or SIP (n = 62). The RFFF group consisted of 81 males and 24 females with a mean age of 56.7 years. The SIP group consisted of 60 males and 25 females with a mean age of 66.7 years.

Table 1. Evidence Table

Author and setting	Study design and evidence level	Sample size and comparison groups	Study findings	Limitations
Li et al., 2016 Department of Stomatology, First Affiliated Hospital of Zhengzhou University	Retrospective study Level II	*N* = 63 RFFF = 24 PMMF = 17	Using UW-QOL, there was statistical significance found in the appearance and shoulder domain when comparing RFFF and PMMF. RFFF scored lower than PMMF in appearance domain. RFFF scored higher than PMMF in shoulder domain.	Small sample size, non-randomized study, and results may have been affected by some patients receiving adjuvant chemotherapy and/or radiation therapy
Zhang et al., 2020 China Medical University	Prospective study Level II	*N* = 145 RFFF = 83 SIP = 62	Using UW-QOL, there were statistical significances found in the activity and recreational domain, with RFFF scoring higher than PMMF in both respective domains.	Small sample size
Zhang et al., 2018 Tianjin Stomatological Hospital, Peking University School and Hospital of Stomatology	Retrospective study Level II	*N* = 90 RFFF = 59 ALTF = 31	Using UW-QOL, there were statistical significances found in the recreation, swallowing, chewing, and speech domains, with RFFF scoring higher than ALTF in all respective domains.	No pre-treatment QOL to compare with post-treatment QOL assessment, non-randomized study, oral function not assessed with UW-QOL questionnaire, and ALTF size larger than standard tongue size.
Liang et al., 2015 Department of Oral and Maxillofacial Surgery, Hospital of Stomatology, Sun Yat-Sen University	Retrospective cohort study Level II	*N* = 65 RFFF = 42 LUFF = 23	Using UW-QOL, no statistical significance found in all domain scores between RFFF and LUFF.	Small sample size

Note. RFFF = radial forearm free flap; PMMF = pectoralis major myocutaneous flap; UW-QOL = University of Washington quality of life questionnaire; SIP = submental island pedicle flap; ALTF = anterolateral thigh flap; LUFF = lateral ulnar forearm flap; QOL = quality of life.

Table 2. Domain Scores for Each Procedure Across Studies: Mean (Standard Deviation)

Domain		RFFF vs. PMMF (Li et al., 2016)	RFFF vs. SIP (Zhang et al., 2020)	RFFF vs. ALTF (Zhang et al., 2018)	RFFF vs. LUFF (Liang et al., 2015)
Pain	RFFF	71.63 (± 9.91)	84.9 (± 10.9)	90.7 (± 13.8)	93.18 (± 11.39)
	Alternative procedure	72.94 (± 11.3)	87.4 (± 12.3)	93.5 (± 11.1)	94.2 (± 10.96)
Appearance	RFFF	57.47 (± 11.44)[a]	80.6 (± 20.4)	84.3 (± 18.5)	82.69 (± 15.76)
	Alternative procedure	68.54 (± 13.24)[a]	74.8 (± 19.7)	82.3 (± 21.6)	94.23 (± 10.96)
Activity	RFFF	64.23 (± 9.52)	75.9 (± 20.8)[a]	89.0 (± 18.1)	76.14 (± 18.06)
	Alternative procedure	63.73 (± 8.41)	65.2 (± 18.5)[a]	87.9 (± 18.1)	84.62 (± 16.26)
Recreation	RFFF	66.59 (± 11.62)	76.4 (± 18.8)	94.5 (± 12.3)[b]	79.55 (± 19.88)
	Alternative procedure	67.26 (± 9.23)	59.8 (± 17.4)	87.1 (± 20.3)[b]	80.77 (± 14.99)
Swallowing	RFFF	44.00 (± 16.27)	50.7 (± 17.5)	78.8 (± 22.5)[c]	80.45 (± 18.64)
	Alternative procedure	43.78 (± 4.95)	54.8 (± 22.4)	67.4 (± 25.2)[c]	88.46 (± 15.19)
Chewing	RFFF	42.45 (± 6.15)	47.9 (± 16.7)	66.1 (± 28.5)[d]	72.73 (± 29.79)
	Alternative procedure	43.43 (± 12.43)	52.3 (± 20.9)	50.0 (± 36.5)[d]	76.92 (± 25.94)
Speech	RFFF	51.27 (± 11.24)	57.1 (± 14.8)	74.1 (± 15.9)[e]	76.82 (± 12.87)
	Alternative procedure	52.63 (± 12.43)	60.9 (± 22.4)	67.1 (± 13.7)[e]	80.77 (± 21.39)
Shoulder function	RFFF	61.52 (± 7.83)	63.7 (± 21.7)	86.8 (± 20.8)	69.09 (± 15.40)
	Alternative procedure	54.65 (± 11.24)	60.8 (± 25.8)	81.5 (± 22.7)	68.46 (± 20.35)
Taste	RFFF	50.91 (± 10.64)	70.2 (± 16.8)	75.4 (± 26.3)	82.73 (± 22.29)
	Alternative procedure	51.24 (± 11.23)	72.6 (± 13.5)	69.6 (± 31.5)	78.46 (± 20.75)
Saliva	RFFF	45.48 (± 16.92)	47.4 (± 13.5)	73.8 (± 26.3)	88.64 (± 18.85)
	Alternative procedure	44.17 (± 12.78)	50.9 (± 11.4)	84.7 (± 22.7)	87.69 (± 21.66)
Mood	RFFF	69.94 (± 9.51)	66.8 (± 14.7)	90.7 (± 17.3)	94.32 (± 10.72)
	Alternative procedure	68.31 (± 14.72)	63.7 (± 20.4)	86.3 (± 23.1)	92.31 (± 15.76)
Anxiety	RFFF	70.57 (± 15.11)	79.4 (± 19.4)	89.1 (± 18.2)	90.45 (± 14.30)
	Alternative procedure	72.55 (± 15.19)	74.8 (± 23.7)	88.3 (± 20.2)	90.77 (± 14.41)

Note. RFF = radial forearm free flap; PMMF = pectoralis major myocutaneous flap; SIP = submental island pedicled; ALTF = anterolateral thigh flap; LUFF = lateral upper arm free flap. Scores not significant except where indicated.
[a]$p = .0001$
[b]$p = .039$
[c]$p = .036$
[d]$p = .038$
[e]$p = .045$

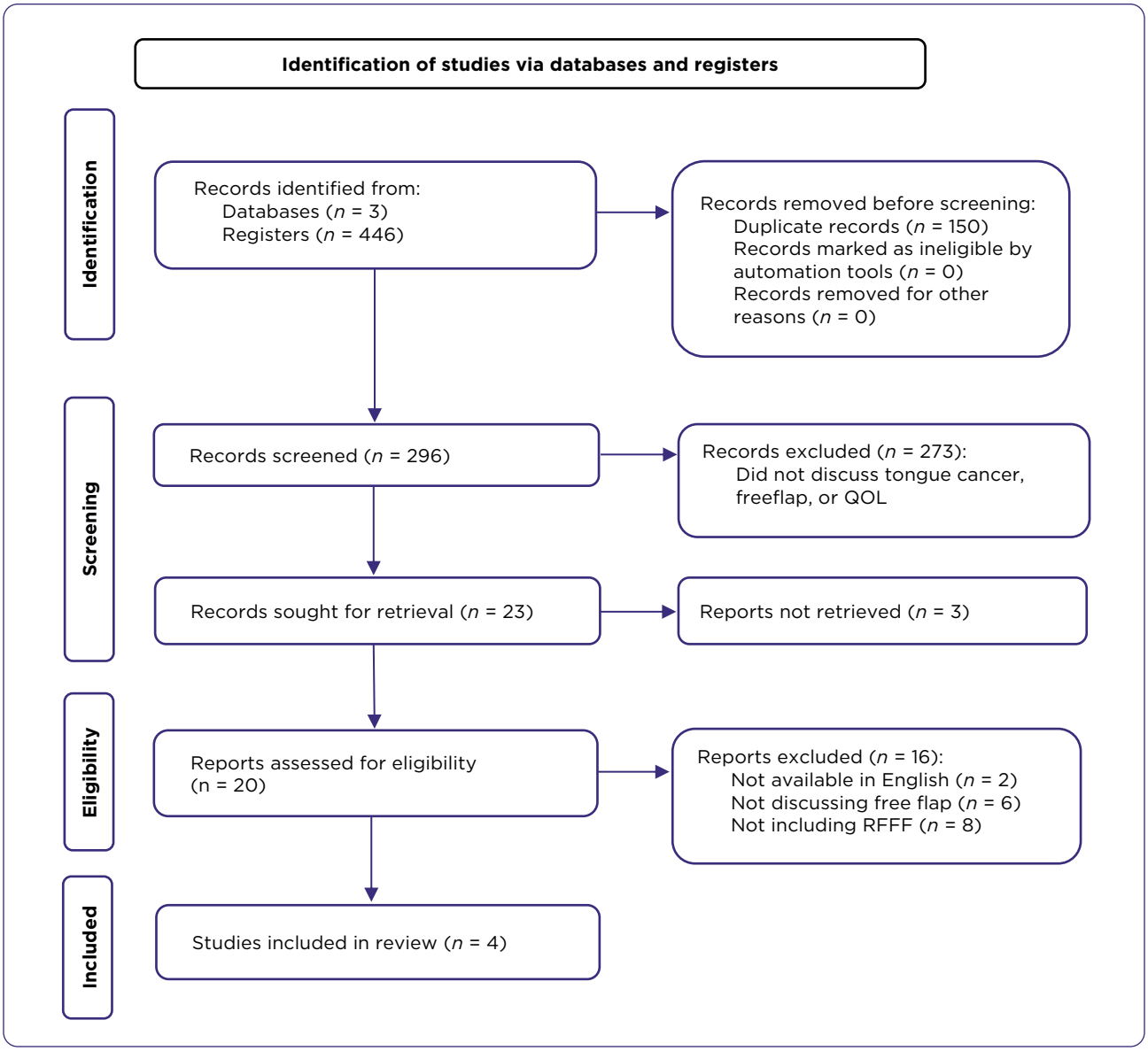

Figure 1. PRISMA flow diagram. QOL = quality of life; RFFF = radial forearm free flap. Adapted from Moher et al. (2009).

The mean follow-up time for both groups was 50.5 months.

From October 2016 to January 2017 and October 2017 to December 2017, Zhang et al. (2018) compared patients from Tianjin Stomatological Hospital and Peking University School, and Hospital of Stomatology who received RFFF (n = 59) or ALTF (n = 31). The RFFF group consisted of 52 males and 24 females with a mean age of 54.3 years. The ALTF group consisted of 29 males and 25 females with a mean age of 33.7 years.

From January 2005 to June 2009, Liang et al. (2015) compared patients from Sun Yat-Sen University who received RFFF (n = 42) or LUFF (n = 23) at 5 to 9 years post procedure. There were 24 males and 18 females in the RFFF group, with a mean age of 47.09 years, and 13 males and 10 females in the LUFF group with a mean age of 41.08 years (p = NS). The UW-QOL questionnaire was completed via telephone.

In summary, mean pain scores in the RFFF groups across the studies ranged from 71.63 to 93.18.

Mean pain scores in the alternative surgery groups ranged from 72.94 to 94.2. Although the mean pain scores in each study were lower in each comparison, there were no significant differences in the mean pain scores between RFFF and the alternative flaps.

Appearance

Mean appearance scores across studies ranged from 57.47 to 84.3 in the RFFF group and from 68.54 to 94.23 in the alternative flaps. There was no trend in higher vs. lower mean scores, and significance was reached only in the Li et al. (2016) study that compared RFFF to PMMF.

Activity

Except when compared to LUFF, activity scores trended higher in the RFFF groups. However, significance was only reached in the Zhang et al. (2020) study, which compared RFFF to SIP.

Recreation

Mean recreation scores in the RFFF groups ranged from 66.59 to 94.5. Mean scores in the alternative flaps ranged from 59.8 to 87.1. Scores were significantly higher in the RFFF group when compared to SIP and ALTF, but they were mildly lower when compared to PMMF and LUFF.

Swallowing

Swallowing mean scores in the RFFF groups ranged from 44 to 80.4, and from 43.78 to 88.46 in the alternative flaps. Only one study reported significantly higher swallowing score in the RFFF group. In the other studies, RFFF scores were minimally lower in comparison to their respective counterparts; however, these were not significant.

Chewing

The RFFF mean chewing score across all studies ranged from 42.45 to 72.73 and 43.43 to 76.92 in all other flaps. The RFFF mean chewing scores were higher only when compared to ALTF, which was statistically significant. In other studies, RFFF scores were minimally lower compared to their respective counterparts; however, these were not significant.

Speech

The overall mean scores for speech in the RFFF group ranged from 51.27 to 76.82 and from 52.63 to 80.77 in the alternative flaps. The RFFF mean score was significantly higher only when compared to ALTF, which resulted in statistical significance. In the other studies, RFFF scores were minimally lower compared to their respective counterparts and without statistical significance.

Shoulder Function

The mean shoulder function scores in the RFFF group across studies ranged from 61.52 to 86.8. Mean shoulder function scores in the alternative flaps ranged from 54.65 to 81.5. Although RFFF mean shoulder function scores were consistently higher in each study, no significant differences were found between RFFF and the alternative flaps.

Taste

Mean taste scores in the RFFF group across studies ranged from 50.91 to 82.73. Mean taste score reported in the alternative flaps range from 51.24 to 78.46. Despite RFFF's lower mean scores compared to PMMF and SIP mean scores, and RFFF's higher mean scores compared to ALTF and LUFF mean scores, no significant difference was reported across all studies.

Saliva

Mean saliva scores in the RFFF group across studies ranged from 45.48 to 88.64. Mean saliva scores reported in the alternative flaps ranged from 44.17 to 87.69. Mean RFFF scores were lower compared to SIP and ALTF and higher compared to PMMF and LUFF without significant differences across all studies.

Mood

The mean mood scores in the RFFF group across studies, which ranged from 66.8 to 94.32, were higher than the mean mood scores reported in the alternative flaps, which ranged from 63.7 to 92.31. However, there was no statistical significance across all studies.

Anxiety

The mean anxiety scores in the RFFF group across studies ranged from 70.57 to 90.45. The mean anxiety scores reported in the alternative flaps ranged from 72.55 to 90.77. The highest mean anxiety scores were reported when comparing RFFF

and LUFF. The largest difference in mean anxiety scores was reported when comparing RFFF and SIP. However, there was no significant difference reported across all studies.

DISCUSSION

Flap reconstruction is critical in tongue cancer patients with moderate-to-severe tongue defects, and choosing the right flap is important in obtaining and preserving the patient's QOL after reconstruction (Liang et al., 2015; Sakr, 2022; Zhang et al., 2018). Based on the number of statistically significant scores determined when comparing domains, RFFF seemed to provide the most improved QOL compared to ALTF, moderate QOL improvement compared to SIP, minimal QOL improvement compared to PMMF, and insignificant QOL improvement compared to LUFF. However, with many factors to consider, no flap was found to better preserve overall QOL compared to the others after reconstruction.

Anterolateral thigh flap is a flap made from an area of skin between the anterior superior iliac spine to the superolateral patella border that includes the lateral femoral circumflex artery for harvest (Wang et al., 2016). The flap's thickness and volume can be tailored to each patient's tongue defect. However, the ALTFs in this review were not trimmed due to flap loss concerns (Zhang et al., 2020; Zhang et al., 2018). This resulted in a statistically significant larger mean flap size when compared to RFFF, which may have contributed to ALTF scoring worse compared to RFFF in recreation, swallowing, chewing, and speech domains. Poor swallowing can be due to a bulky flap interfering with preserved tongue mobility, poor epiglottis reconstruction, and the natural loss of flap shape in resemblance to the epiglottis; however, this can be mitigated if the flap is pliable and with adequate volume, which is not always seen with ALTF (Hsiao et al., 2010; Zhang et al., 2020; Zhang et al., 2018). Chewing function depends on dentition, jaw function, and tongue function (Hsiao et al., 2010; Zhang et al., 2020; Zhang et al., 2018). It is associated with oral health–related QOL, and without preserved chewing function, a patient's oral intake and intake enjoyment can be negatively impacted (Brennan et al., 2008). Despite similar rates and distribution of mandibular rim resection, occlusion statures, and denture usage between the two groups, RFFF scored higher than ALTF, which again suggests that RFFF provides better tongue function. Patients who received RFFF were also found to undergo fewer concurrent bilateral neck dissection but had longer mean follow-up time compared to patients who received ALTF.

Submental island pedicled is a flap harvested from the submental portion of the neck that includes the platysma, the anterior belly of the ipsilateral digastric muscle, and the submental arteries (Moubayed et al., 2014). When compared to RFFF, SIP was reported to have worse activity and recreational outcomes. Patients who underwent SIP also reported higher levels of fatigue, mobility, and anhedonia compared to RFFF. However, patients who received RFFF were younger, more socially active, had better baseline health status, and less severe systemic disease as compared to the SIP group, which could explain the difference.

Pectoralis major myocutaneous flap reconstruction includes removing the pectoralis major muscle, a muscle in the chest wall that plays a significant role in the adduction and internal rotation of the glenohumeral joint (Falade et al., 2024). Patients with PMMF reported reduced range of motion and shoulder strength compared to patients with RFFF, lasting months to a year after reconstruction (Falade et al., 2024). In appearance, PMMF outscored RFFF. However, all patients who received RFFF were females, who may be more conscious of the exposed RFFF reconstruction scar compared to their male counterparts. Compared to RFFF, PMMF is a bulkier and less malleable flap with a high fat content, increasing the risk of developing fat necrosis (Zhang et al., 2018).

Lateral upper arm free flap reconstruction entails removing the skin located between the deltoid insertion and lateral epicondyle of the humerus and the posterior radial collateral artery (Danker et al., 2023). This results in a long, thin, and pliable pedicled flap, and a donor site that can be partially or completely closed. Since both RFFF and LUFF are thin and pliable, this is likely why no significant differences were noted between them. However, LUFF may be advantageous over RFFF. Danker et al. (2023) reported improved donor site morbidity in LUFF vs. RFFF since LUFF's donor site can be partially or completely closed, whereas

RFFF's donor site can only be open. Several techniques have been attempted to overcome RFFF's donor site morbidity with minimal success, including negative pressure wound therapy (Shimada et al., 2022).

Limitations

The limitations of this review are based on the characteristics of the included articles, which did not encompass the complete array of tongue flap reconstructions available, such as rectus abdominus flap, infrahyoid fasciomyocutaneous flap, pedicled latissimus dorsi flap, etc. (Vincent et al., 2019). Two studies were non-randomized, which could lead to selection bias. The sample size included in each of the articles was also relatively small, ranging from 41 to 145, which could lead to insufficient power to detect differences. There were also inclusion discrepancies on tongue cancer staging, with one study only including tongue cancers staged T2 or T3, and one study including T1 through T4. Questionnaire administration varied between studies, with one administered in-person, one administered in-person and through mail, and two studies administered over the phone. In-person interviewers were not blinded, leading to concerns of potential interviewer bias. However, one study's phone interviewers were blinded, and the other study's interviewer was the same physician administering the questionnaire as written. Time of questionnaire administration was only well-defined in two studies, which was at 12 months after the operation. Follow-up timing varied between studies, ranging from 12 months to 9 years. There may also be limitations in extending these findings to different demographic groups, as all studies were conducted in China. These discrepancies limit these findings from being administered in all settings.

Implications

Based on the reviewed articles, RFFF and LUFF are both flaps suitable for preserving QOL in patients undergoing glossectomy. However, LUFF can be considered over RFFF if there is an increased concern for donor site morbidity. Pectoralis major myocutaneous flap should not be considered for patients requiring immediate shoulder use or for patients who cannot complete rehabilitation. However, for patients with severe sternal infections, PMMF flap may be the only choice, and shoulder function has been seen to improve with physiotherapy (Falade et al., 2024). Pectoralis major myocutaneous flap can also be considered over RFFF for patients who are concerned about a noticeable scar. Submental island pedicled should only be considered for patients with good baseline health status prior to glossectomy and reconstruction. Anterolateral thigh flap should not be considered for glossectomy if the flap's thickness and volume cannot be individualized to the patient's tongue defect prior to reconstruction.

Although APPs may not directly make surgical decisions, they are often the first providers to interview and assess a patient's health status and goals of care before the surgical team. This opens a unique and vital opportunity for APPs to collaborate with the surgical team on choosing a flap that best upholds the patient's goals, values, and QOL. Understanding which flap is chosen can also better prepare APPs for pre-operative and post-operative patient teaching, allowing patients the ability to better understand how their QOL may look after the procedure. In follow-up visits, APPs can also continue to assess patients' QOL by administering QOL questionnaires, such as UW-QOL, after the procedure to ensure that patients continue to adjust well.

CONCLUSION

In this review, no flap was found to be significantly superior in preserving patients' QOL following procedures when using the UW-QOL version 4.0 questionnaire. Therefore, APPs have an integral role in collaborating with the surgical team by assessing a patient's health status, functional needs, goals, and values prior to glossectomy and reconstruction. This information can help guide the patient's team to choose a flap that best preserves QOL and tongue function and prepares the patient for comprehensive pre-operative, post-operative, and lifelong care.

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References

Brennan, D. S., Spencer, A. J., & Roberts-Thomson, K. F. (2008). Tooth loss, chewing ability and quality of life. *Quality of Life Research*, *17*(2), 227–235. https://doi.org/10.1007/s11136-007-9293-2

Costantino, A., Festa, B. M., Kim, S. H., Baik, F. M., Wang, C. C., Pirola, F.,...De Virgilio, A. (2023). Complications of pectoralis major myo-cutaneous flap, anterolateral thigh flap and radial forearm free flap after total laryngectomy with partial pharyngectomy: A systematic review and network meta-analysis. *Microsurgery*, *43*(3), 286–296. https://doi.org/10.1002/micr.30977

Danker, S., Shuck, J. W., Taher, A., Mujtaba, B., Chang, E. I., Chu, C. K.,...Largo, R. D. (2023). The lateral forearm flap versus traditional upper extremity flaps: A comparison of donor site morbidity and flap thickness. *Head & Neck*, *45*(9), 2413–2423. https://doi.org/10.1002/hed.27446

de Bree, R., Rinaldo, A., Genden, E. M., Suárez, C., Rodrigo, J. P., Fagan, J. J.,...Leemans, C. R. (2008). Modern reconstruction techniques for oral and pharyngeal defects after tumor resection. *European Archives of Oto-Rhino-Laryngology*, *265*(1), 1–9. https://doi.org/10.1007/s00405-007-0413-y

Falade, I. O., Murphy, A. I., Switalla, K. M., Yin, R. R., & Rose, J. A. (2024). Functional donor-site morbidity following reconstruction with pectoralis major flaps: A systematic review. *JPRAS Open*, *39*, 278–290. https://doi.org/10.1016/j.jpra.2024.01.007

Ferneini, E. M., Goupil, M. T., & Halepas, S. (2022). *The history of maxillofacial surgery: An evidence based journey*. Springer.

Haraldstad, K., Wahl, A., Andenæs, R., Andersen, J. R., Andersen, M. H., Beisland, E.,...Helseth, S. (2019). A systematic review of quality of life research in medicine and health sciences. *Quality of Life Research*, *28*(10), 2641–2650. https://doi.org/10.1007/s11136-019-02214-9

Hsiao, H.-T. M. D., Leu, Y.-S. M. D., & Tung, K.-Y. M. D. (2010). Epiglottis reconstruction with free radial forearm flap after supraglottic laryngectomy. *American Journal of Otolaryngology*, *31*(2), 132–135. https://doi.org/10.1016/j.amjoto.2008.11.004

Kassianos, A. P. (2022). *Handbook of quality of life in cancer*. Springer.

Li, W., Zhang, P., Li, R., Liu, Y., & Kan, Q. (2016). Radial free forearm flap versus pectoralis major pedicled flap for reconstruction in patients with tongue cancer: Assessment of quality of life. *Medicina Oral, Patologia Oral Y Cirugia Bucal*, *21*(6), e737–e742. https://doi.org/10.4317/medoral.21274

Liang, Y., Cui, Y., & Liao, G. (2015). Comparison of quality-of-life in tongue cancer patients undergoing tongue reconstruction with lateral upper arm free flap and radial forearm free flap. *International Journal of Clinical and Experimental Medicine*, *8*(3), 4533–4538.

Mehanna, H., Carter, B., Hartley, A., Abou-Foul, A. K., Brooks, J., Jones, J.,...Morton, R. P. (2023). Patient preference for commonly-used, head and neck cancer-specific quality of life questionnaires in the follow-up setting (Determin): A multi-centre randomised controlled trial and mixed methods study. *Clinical Otolaryngology*, *48*(4), 613–622. https://doi.org/10.1111/coa.14054

Mohamad, I., Glaun, M. D. E., Prabhash, K., Busheri, A., Lai, S. Y., Noronha, V., & Hosni, A. (2023). Current treatment strategies and risk stratification for oral carcinoma. *American Society of Clinical Oncology Educational Book*, *43*(43), e389810. https://doi.org/10.1200/EDBK_389810

Moubayed, S. P., Rahal, A., & Ayad, T. (2014). The submental island flap for soft-tissue head and neck reconstruction: Step-by-step video description and long-term results. *Plastic And Reconstructive Surgery*, *133*(3), 684–686. https://doi.org/10.1097/PRS.0000000000000058

Rogers, S. N., Lowe, D., Yueh, B., & Weymuller, E. A., Jr. (2010). The physical function and social-emotional function subscales of the University of Washington Quality of Life Questionnaire. *Archives of Otolaryngoly-Head & Neck Surgery*, *136*(4), 352–357. https://doi.org/10.1001/archoto.2010.32

Sakr, M. (2022). *Tongue lesions: Diagnostic challenges and therapeutic strategies* (1st 2022. ed.). Springer International Publishing. https://doi.org/10.1007/978-3-031-08198-9

Shimada, K., Ojima, Y., Ida, Y., Komiya, T., & Matsumura, H. (2022). Negative-pressure wound therapy for donor-site closure in radial forearm free flap: A systematic review and meta-analysis. *International Wound Journal*, *19*(2), 316–325. https://doi.org/10.1111/iwj.13632

Vincent, A., Kohlert, S., Lee, T. S., Inman, J., & Ducic, Y. (2019). Free-flap reconstruction of the tongue. *Seminars in Plastic Surgery*, *33*(1), 38–45. https://doi.org/10.1055/s-0039-1677789

Wang, L., Liu, K., Shao, Z., & Shang, Z. J. (2016). Individual design of the anterolateral thigh flap for functional reconstruction after hemiglossectomy: Experience with 238 patients. *International Journal of Oral and Maxillofacial Surgery*, *45*(6), 726–730. https://doi.org/10.1016/j.ijom.2015.11.020

Zhang, J., Wang, Y., Han, X., & Chen, H. (2020). Comparison of clinical results and quality-of-life in tongue cancer patients undergoing submental island flap and radial forearm free flap reconstruction. *Journal of Oral Maxillofacial Surgery*, *78*(9), 1639–1644. https://doi.org/10.1016/j.joms.2020.04.045

Zhang, P. P., Meng, L., Shen, J., Liu, H., Zhang, J., Xiang, X., & Yan, Y. B. (2018). Free radial forearm flap and anterolateral thigh flap for reconstruction of hemiglossectomy defects: A comparison of quality of life. *Journal of Cranio-Maxillo-Facial Surgery, 46*(12), 2157–2163. https://doi.org/10.1016/j.jcms.2018.10.006