



Reconstruction of partial hypopharyngeal defects following total laryngectomy: Pectoralis major myofascial versus myocutaneous flaps

Anthony M. Tonsbeek^{a,*}, Caroline A. Hundepool^a,
Liron S. Duraku^b, Aniel Sewnaik^c, Marc A.M. Mureau^a

^a Department of Plastic & Reconstructive Surgery, Erasmus MC Cancer Institute, University Medical Center Rotterdam, Rotterdam, the Netherlands

^b Department of Plastic, Reconstructive and Hand Surgery, Amsterdam UMC, Amsterdam, the Netherlands

^c Department of Otorhinolaryngology and Head and Neck Surgery, Erasmus MC Cancer Institute, University Medical Center Rotterdam, Rotterdam, the Netherlands

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Summary Background: To date, few comparative studies exist for partial hypopharyngeal defect reconstruction following total laryngectomy. In the absence of objective evidence from comparative studies, the ideal flap choice remains controversial, leading to heterogeneity in institutional treatment protocols. Comparative studies between different reconstructive techniques are required. Therefore, this study compared postoperative outcomes of pectoralis major myocutaneous (PMMC) and myofascial (PMMF) flaps.

Methods: A single-center retrospective cohort study was performed between 2000 and 2022, which included all consecutive patients who underwent a PMMC or PMMF flap reconstruction following total laryngectomy and partial hypopharyngectomy. Primary outcomes were suture line leakages (conservative management), fistulas (surgical management), and strictures. Secondary outcomes included flap failure, donor-site morbidity, and the start of oral intake.

Results: In total, 122 patients were included (109 PMMC and 13 PMMF flap reconstructions). The incidence of suture line leakage was significantly higher ($p = 0.007$) after PMMC flaps (57%) compared with PMMF flaps (15%). Between PMMC and PMMF flaps, fistula (19% vs. 0%) and stricture rates (22% vs. 15%) did not differ significantly. No differences in flap failure, donor-site morbidity, or start of oral intake were observed.

* Correspondence to: Department of Plastic & Reconstructive Surgery, Erasmus MC Cancer Institute, University Medical Center Rotterdam, P.O. Box 2040, NL-3000 CA Rotterdam, the Netherlands.

E-mail address: a.tonsbeek@erasmusmc.nl (A.M. Tonsbeek).

Conclusions: PMMF flaps have inherent advantages (e.g., reduced bulk, increased pliability) over conventional PMMC flaps and have non-inferior results compared to the latter in terms of postoperative complications. Although the final choice for reconstruction should be patient-tailored, a PMMF flap can be considered a reliable primary choice that is feasible in most patients.

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Partial hypopharyngeal defects following total laryngectomy (TLE) pose a substantial reconstructive challenge for surgeons. Following surgery, quality of life is reduced drastically due to the inherent loss of speech and problems with oral alimentation. In addition, severe complications like fistulas may occur relatively frequently due to the fragility of the tissues subsequent to prior radiotherapy.¹ In light of this, any reconstruction warrants a patient-tailored approach to achieve a high quality of life while minimizing procedure-related morbidity. Over the years, various techniques for reconstructing partial hypopharyngeal defects following TLE, if insufficient mucosal tissue remains for primary closure, have been described. Nonetheless, no international agreement has been reached regarding the optimal reconstructive treatment for partial hypopharyngeal defects, causing substantial institutional heterogeneity.²

To date, nearly all applied techniques to reconstruct the neopharynx involve inversion of a myo- or fasciocutaneous (free) flap onto the remaining pharyngeal mucosal segment, creating a cutaneous inner lining of the conduit. Historically, the pectoralis major myocutaneous (PMMC) flap has been the workhorse flap for partial hypopharyngeal defects since its first description by Ariyan in 1979.³ However, reports of inherent disadvantages of the PMMC flap in oncological head and neck reconstruction related to its bulkiness, poor pliability, and relatively high rates of fistulas and donor-site morbidity tempered its initial popularity.⁴⁻⁶ Consequently, with the advent of microvascular reconstructions, some institutions currently advocate the use of free flaps to improve postoperative outcomes and reconstruction-related morbidity.

Concurrent with the introduction of free flaps for hypopharyngeal defect reconstruction in the mid-1980s, Robertson and Robinson acknowledged the inherent problems of the “traditional” PMMC flap and proposed the use of the pectoralis major myofascial (PMMF) flap.^{6,7} This alternative technique hypothetically circumvents many known disadvantages of the PMMC flap because of the absence of the pectoral skin island. Although the results of their study were promising, the practice of using myocutaneous (free) flaps at many institutions has remained unchanged. Contemporary reports of PMMF flaps for hypopharyngeal defects are very limited with only one study in 2012 by Montemari et al., which corroborated the relatively low complication rates by Robertson and Robinson in 1985.^{4,6,7} Remarkably, no studies comparing different pectoralis major flaps for partial hypopharyngeal defect reconstruction have been performed since its first description.²

At our institute, both PMMC and PMMF flaps are used as the primary reconstructive choice of partial hypopharyngeal defects. In the absence of comparative studies between

myocutaneous and myofascial pectoralis major flap reconstructions, the present study aimed to compare postoperative complication rates following both types of reconstruction and to determine the role and potential of PMMF reconstructions for this specific indication.

Methods

Study design

A retrospective single-center study was performed including all consecutive patients who underwent a pectoralis major flap reconstruction following TLE with partial hypopharyngectomy between January 1, 2000 and April 1, 2022. All patients had a partial hypopharyngeal defect that was reconstructed with a PMMF or PMMC flap. All reconstructions were single-stage and performed immediately after the oncological resection by the head and neck ENT surgeon. In a PMMF flap reconstruction, the inner lining of the hypopharynx was reconstructed using a split-thickness skin graft. The surgical technique of a PMMF flap reconstruction is depicted in [Figure 1](#). Flap choice was patient-tailored and was ultimately decided by the reconstructive plastic surgeon in close liaison with the head and neck ENT surgeon. The choice of a PMMF flap reconstruction was influenced by the amount of tissue bulk of the chest wall and/or presence of chest hair (without the need for adjuvant radiotherapy). The electronic medical records of all patients were reviewed. The institutional medical ethics committee approved the study prior to the start of the data collection (MEC-2021-0680).

Outcomes

Primary outcomes were suture line leakage, fistula, and stricture rates. Suture line leakage was defined as any abnormal connection between the skin or trachea and the reconstructed hypopharyngeal segment that spontaneously resolved following prolonged tube feeding, antibiotic therapy, and/or scopolamine therapy. Cases in which there was only radiological evidence of leakage on a barium swallow test (routinely performed two weeks post-operatively) without clinical signs of leakage were regarded to have suture line leakage. Cases in which conservative management was unsuccessful, subsequently requiring surgical treatment, were defined as a fistula. A stricture was defined as any abnormal narrowing of the reconstructed hypopharynx requiring dilation or surgical revision.

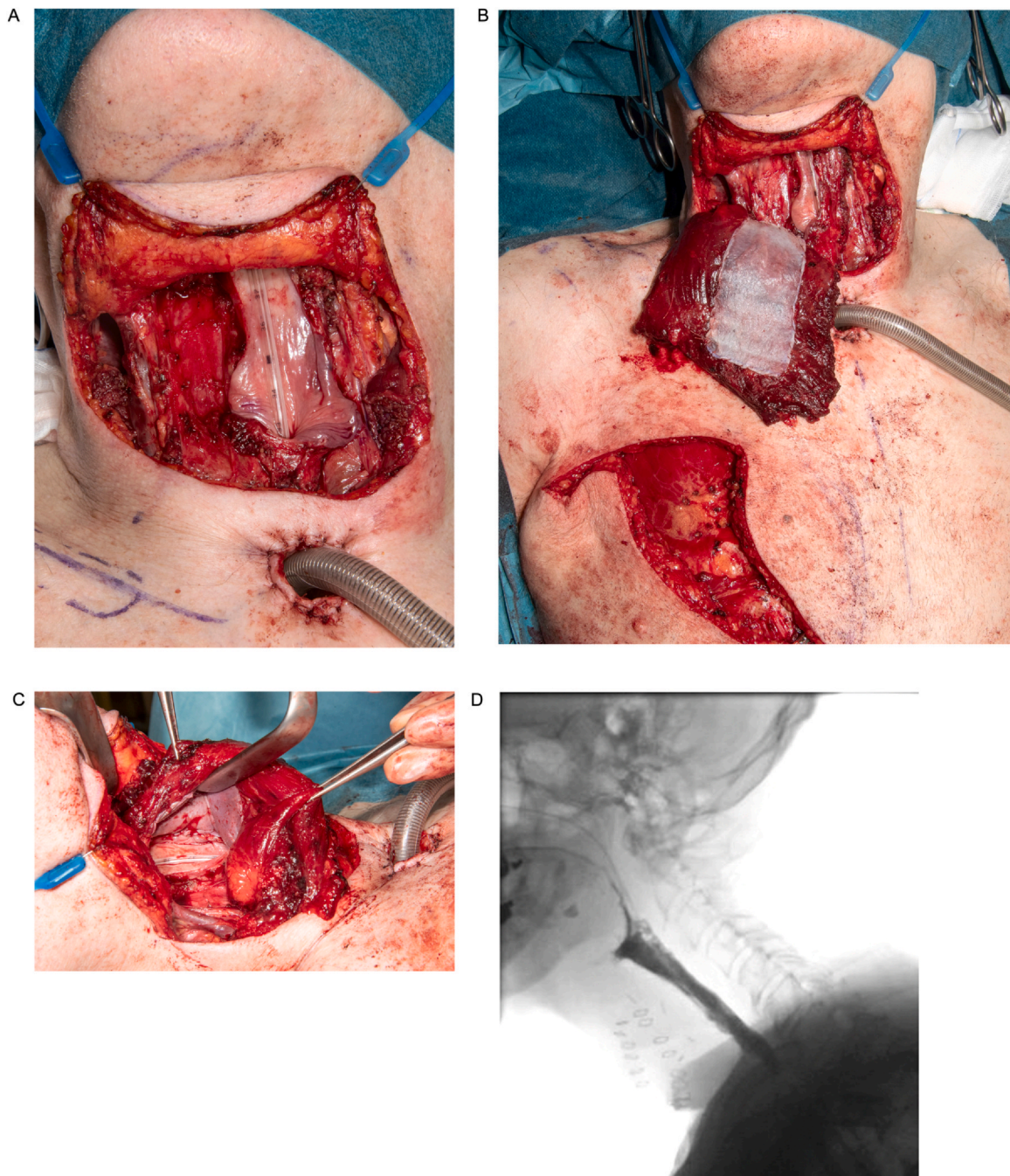


Figure 1 Reconstruction of a partial hypopharyngeal defect using a pectoralis major myofascial flap with a split thickness skin graft for the inner lining of the neopharynx. *Panel A:* A partial hypopharyngeal defect following a total laryngectomy and bilateral neck dissection measuring 8 cm in length and 3 cm at the narrowest point cranially. *Panel B:* A right-sided pectoralis major flap, with an unmeshed split-thickness skin graft sutured onto the muscle using a running continuous Vicryl Rapide 4-0 suture. *Panel C:* Reconstruction of the anterior and lateral hypopharyngeal wall using the split-thickness skin graft sutured to the remaining hypopharynx using horizontal mattress sutures. *Panel D:* An oral contrast swallowing test was performed ten days postoperatively to examine the passage through the neopharynx. A swift passage without suture line leakage was observed, and the patient could gradually restart his oral intake.

Secondary outcomes were total flap failure, other recipient-site complications, donor-site complications, duration of hospital stay, and start of oral intake. Total flap failure was defined as complete flap necrosis or the need for total flap removal due to unsolvable concomitant recipient-site complications. The management of failed flaps and subsequent complications were analyzed separately. The

severity of all complications was graded using the international Clavien-Dindo classification (Figure 2).¹²

Statistical analysis

Parametric and non-parametric data are shown as means with standard deviations and medians with interquartile

Grade I	Any deviation from the normal postoperative course without the need for pharmacological treatment or surgical, endoscopic, and radiological interventions
Grade II	Requiring pharmacological treatment with drugs other than such allowed for Grade I complications
Grade III	Requiring surgical, endoscopic or radiological intervention
Grade IV	Life-threatening complication requiring IC/ICU management
Grade V	Death of a patient

Figure 2 International Clavien-Dindo classification system of complication severity.¹²

ranges (IQRs). Categorical data are presented as frequencies and percentages. Numeric data were analyzed using Student's t-tests or Mann-Whitney U tests. Categorical data were analyzed using χ^2 and Fisher's exact tests for binary variables or Mantel-Haenszel tests for nominal and ordinal variables. All statistical analyses were performed using SPSS version 28 (Armonk, NY: IBM Corp). Two-sided p -values < 0.05 were considered statistically significant.

Results

Between January 1, 2000 and April 1, 2022, 122 patients underwent a total laryngectomy with a partial hypopharyngectomy at our institution. The partial hypopharyngeal defect was reconstructed using a pedicled pectoralis major flap in all patients. Thirteen patients received a myofascial (PMMF) flap with a split-thickness skin graft as the inner lining, whereas the majority of patients ($n = 109$) received a myocutaneous (PMMC) flap with a skin island as the inner lining. In total, seven different plastic surgeons performed a PMMF reconstruction. Reasons for choosing a PMMF were as follows: abundant chest hair ($n = 3$), bulky subcutaneous tissue ($n = 4$), and reason unknown ($n = 6$). The baseline characteristics of both reconstruction groups are shown in Table 1. Body mass index (BMI) differed significantly at baseline ($p = 0.001$), with a median of 26.2 (IQR, 23.3-30.79 kg/m²) versus 21.6 kg/m² (IQR, 19.0-24.9 kg/m²) for the PMMF and PMMC groups, respectively. In addition, a statistically higher percentage ($p = 0.047$) of female patients was observed in the PMMF group (39%) versus the PMMC group (15%). The median follow-up time of all patients was 30 months (IQR, 10-77 months).

Primary outcomes

Suture line leakage was the most common complication, which occurred in 52% (58/112) of all patients at a median of 12 days postoperatively (IQR, 7-15 days). The rate observed for PMMC flap reconstructions was significantly higher ($n = 56/99$, 57%) than that of PMMF flap reconstructions ($n = 2/13$, 15%; $p = 0.007$; Table 2). Closure of suture line leakage using conservative measures required a median of 22 days (IQR, 13-36 days).

Fistula incidence did not differ significantly between both groups (PMMF: $n = 0/11$, 0% vs. PMMC: $n = 10/52$, 19%; Table 2). Fistulas occurred at a median of 8 days postoperatively (IQR, 4-12 days). Fistulas were closed using the following techniques: contralateral PMMC ($n = 3$) or PMMF

($n = 1$) flap, resuturing the dehiscent PMMC skin island ($n = 2$), internal mammary artery perforator flap complicated by necrosis and a subsequent anterolateral thigh free flap ($n = 1$), radial forearm free flap ($n = 1$), supraclavicular flap ($n = 1$), and salivary bypass tube with primary closure ($n = 1$). Of all fistulas, 6 out of 10 could be closed permanently. Resumption of any oral diet for patients with a fistula occurred at a median of 58 days after surgery (IQR, 24-119 days). All patients in the PMMF group were able to restart their oral intake, whereas seven patients in the PMMC group (6.6%) were not. The occurrence of strictures was comparable for both groups (PMMF: $n = 2/12$, 15% and PMMC: $n = 24/109$, 22%; Table 2). Overall, strictures occurred at a median time of 230 days (IQR, 160-506 days) after surgery.

Secondary outcomes

Total flap failures only occurred in PMMC flap reconstructions ($n = 2/109$, 2%; Table 2), which were salvaged using a contralateral PMMC flap. Both cases of complete necrosis of the PMMC were presumably the result of venous congestion due to a subcutaneous tunnel that was too narrow.

Table 3 shows all recipient-site complications according to their respective Clavien-Dindo severity grade. No statistically significant difference in the total number of recipient-site complications per patient was observed (PMMF 46%, PMMC 73%). One patient with a PMMC flap reconstruction unexpectedly died 18 days postoperatively due to unknown reasons.

Regardless of complication severity, the total rate of donor-site complications was comparable for PMMF (15%) and PMMC (20%) reconstructions. The most common donor-site complications were hematoma and hemorrhage, which both occurred in 4.9% of all patients. No statistically significant differences in individual donor-site complications were observed between both groups.

Perioperative course and aftercare

Total surgery duration did not differ significantly between groups, with a median of 298 min (IQR, 238-373 min) and 317 min (IQR, 237-402 min) for the PMMF and PMMC groups, respectively. In addition, the difference in duration of hospital stay was not statistically significant, with a median duration of 16 days (IQR, 13-18 days) for the PMMF group versus 19 days (IQR, 15-24 days) for the PMMC group. PMMF patients received postoperative radiotherapy in 38.5% of all cases versus 51.4% in the PMMC group, but this difference

Table 1 Baseline characteristics of 112 patients who underwent total laryngectomy with partial hypopharyngectomy according to reconstructive technique.

	Pectoralis major myofascial flap (n = 13)	Pectoralis major myocutaneous flap (n = 109)	p-value
Age - years			0.26
Median, IQR	68.0 [55.5-75.0]	62.0 [56.5-69.0]	
Sex - no. (%)			0.047 ^a
Female	5 (38.5)	16 (14.7)	
BMI - kg/m ²			0.001 ^a
Median, IQR	26.2 [23.3-30.7]	21.6 [19.0-24.9]	
Comorbidity - no. (%)			0.21
None	2 (15.4)	39 (36.4)	
One comorbidity	5 (38.5)	40 (37.4)	
More than one comorbidity	6 (46.2)	28 (26.2)	
Smoking - no. (%)			0.28
Never	1 (7.7)	3 (3.0)	
Quit smoking at > 4 weeks prior to surgery	9 (69.2)	52 (52.5)	
Active smoker	3 (23.1)	44 (44.4)	
Indication for surgery			-
Laryngeal carcinoma	6 (46.2)	44 (40.3)	
Hypopharyngeal carcinoma	6 (46.2)	50 (45.9)	
Afunctional larynx/chondroradionecrosis	1 (7.7)	15 (13.8)	
Tumor stage (AJCC 8th edition)			0.66
T1	0 (0)	3 (3.2)	
T2	3 (25.0)	12 (12.8)	
T3	3 (25.0)	18 (19.1)	
T4a	6 (50.0)	57 (60.6)	
T4b	0 (0)	4 (4.3)	
Prior head & neck surgery - no. (%)			-
Lymph node dissection, uni- or bilateral	0 (0)	3 (2.8)	
Tracheotomy	2 (15.4)	34 (32.1)	
Other	4 (30.7) ^b	12 (11.3) ^c	
Prior radiotherapy - no. (%)	10 (76.9)	59 (54.1)	0.15
Prior chemotherapy - no. (%)	1 (7.7)	23 (21.1)	0.46

Abbreviations: AJCC=American Joint Committee on Cancer; CHEP=cricohyoidoepiglottopexy; LND=lymph node dissection; PM=pectoralis major.

^a Statistically significant difference ($p < 0.05$).

^b Unilateral LND + PM flap (n = 1), local resection tongue + unilateral LND (n = 1), medialization thyroplasty (n = 1), partial glossectomy + unilateral LND + free flap (n = 1).

^c Uni- or bilateral LND + marginal mandibular resection (n=5), carotid endarterectomy (n=1), osteocutaneous fibula + PM flap (n = 1), carotid bypass surgery (n = 1), closure of a laryngeal fistula + PM flap (n = 1), closure of laryngeal fistula + free flap (n = 1), CHEP with/without LND (n = 2).

Table 2 Postoperative complications per reconstruction group in 112 patients who underwent total laryngectomy with partial hypopharyngectomy.

	Pectoralis major myofascial flap (n = 13)	Pectoralis major myocutaneous flap (n = 109)	p-value
Suture line leakage ^a	2/13 (15%)	56/99 (57%)	0.007 ^b
Fistula ^c	0/11 (0%)	10/52 (19%)	0.19
Stricture	2/13 (15%)	24/109 (22%)	0.73
Total flap failure	0/13 (0%)	2/109 (2%)	1.00

^a An abnormal connection between skin or trachea and the reconstructed hypopharyngeal segment that spontaneously resolved following prolonged tube feeding, antibiotic therapy, and/or scopolamine therapy.

^b Statistically significant difference ($p < 0.05$).

^c An abnormal connection between skin or trachea and the reconstructed hypopharyngeal segment requiring any surgical intervention.

Table 3 Postoperative recipient-site complications per reconstruction group by complication severity in 112 patients who underwent total laryngectomy with partial hypopharyngectomy.

Recipient-site complications	Pectoralis major myofascial flap (n = 13)				Pectoralis major myocutaneous flap (n = 109)			
	Clavien-Dindo grade ^a			n (%)	Clavien-Dindo grade ^a			n (%)
	I	II	III		I	II	III	
Fistula ^b	-	-	-	0 (0)	-	-	10	10 (19.2)
Suture line leakage ^c	1	1	-	2 (15.4)	25	31	-	56 (56.6)
Stricture	-	-	2	2 (15.4)	-	-	24	24 (22.0)
Total flap failure	-	-	-	0 (0)	-	-	2	2 (1.8)
Hemorrhage	-	-	-	0 (0)	1	-	16	17 (15.6)
Superficial wound dehiscence	3	1	-	4 (30.8)	5	2	-	7 (6.4)
Wound infection	-	1	-	1 (7.7)	-	22	-	22 (20.2)
Other ^d	-	-	1	1 (7.7)	3	1	2	6 (5.5)
Total number of patients with any recipient-site complication ^e				6 (46.2)				79 (72.5)

^a CD grade I/II: conservative management, CD grade III: surgical management

^b An abnormal connection between skin or trachea and the reconstructed pharyngeal segment requiring any surgical intervention

^c An abnormal connection between skin or trachea and the reconstructed hypopharyngeal segment that spontaneously resolved following prolonged tube feeding, antibiotic therapy, and/or scopolamine therapy.

^d PMMF group: chyle leakage (n = 1, CD grade II). PMMC group: chyle leakage (n = 3, CD grade I (2), CD grade II (1)), exposed carotid bypass (n = 1, CD grade III), Laparotomy after PEG placement due to stomach perforation (n = 1, CD III), abscess (n = 1, CD grade I).

^e Total number of patients is lower than the total number of complications because some patients had multiple complications.

was not statistically significant. The requirement for adjuvant chemotherapy, however, did differ significantly ($p = 0.026$) between both reconstructive groups (PMMF 23%, PMMC 4%).

Oral intake

Although the start of oral intake was markedly later for PMMC (median 23 days, IQR 14-39 days) versus PMMF (median 15 days, IQR 14-21) flap patients, this difference was not statistically significant. Moreover, no significant differences were observed in the ability to restart oral intake between both groups in patients who did not develop either a fistula or suture line leakage.

Discussion

This retrospective study compared the surgical outcomes of partial hypopharyngeal defect reconstruction using both PMMC and PMMF flaps, which, to our knowledge, is the

largest study to date. Our study demonstrates that PMMF reconstructions generally carry a smaller risk of postoperative recipient-site complications with significantly lower rates of suture line leakage compared with PMMC reconstructions. No statistically significant differences were observed in fistula rates, flap failures, donor-site complications, hospital stay, and start of oral intake.

The relatively low rates of fistulas and suture line leakage after PMMF reconstructions are in line with the low rates reported in prior case series (Table 4).^{4,7} Both Robertson and Robinson and Montemari et al. independently reported low rates of suture line leakage (14% and 2%, respectively) and fistulas (0% and 2%, respectively).^{4,7} In comparison, the rates of suture line leakage (57%) and fistulas (19%) we observed after PMMC flap reconstructions were substantially higher than after PMMF reconstructions (15% and 0%, respectively). Similarly, our results corroborate the higher rates of suture line leakage and fistulas following PMMC flap reconstructions (6%–48% and 0%–10%, respectively) reported in literature.²

Notably, our PMMF flap reconstructions were performed mostly (n = 11/13, 85% of the total cohort) in the past

Table 4 Overview of reported complication rates after pectoralis major myofascial flap reconstruction of total laryngectomy with partial hypopharyngeal defects.

	Current study	Robertson and Robinson ⁷	Montemari et al. ⁴
Suture line leakage ^a	2/13 (15.4%)	1/7 (14.3%)	1/43 (2.3%)
Fistula ^b	0/13 (0%)	0/6 (0%)	1/43 (2.3%)
Stricture	2/13 (15.4%)	3/7 (42.9%)	1/44 (2.3%)
Complete flap failure	0/13 (0%)	0/7 (0%)	0/44 (0%)

^a An abnormal connection between skin or trachea and the reconstructed hypopharyngeal segment that spontaneously resolved following prolonged tube feeding, antibiotic therapy, and/or scopolamine therapy.

^b An abnormal connection between skin or trachea and the reconstructed hypopharyngeal segment requiring any surgical intervention.

decade (2012-2022). The reason for this probably lies in improved reconstructive insights and patient selection, which were made in an attempt to limit the morbidity and complication rates in this notoriously fragile population. The significantly better result for PMMF flaps in terms of suture line leakage was also found when performing a sub-analysis of patients treated between 2012 and 2022 (PMMF 18% vs. PMMC 62%, $p = 0.016$), indicative of the consistently higher rate of morbidity in PMMC flap reconstructions.

Limiting the risk of fistula formation is crucial considering the associated morbidity, potential for lethal complications (e.g., aspiration, carotid blow-out), delay of adjuvant therapy, prolonged hospital stay, and increased healthcare costs.¹³ The higher rates of salivary leakage after PMMC reconstructions may be explained by suboptimal vascularity of the cutaneous skin island, leading to partial skin island necrosis at its most distal borders. By omitting the skin island, the highly vascularized pectoralis major muscle may aid optimal wound healing at the suture lines and additionally eliminates the problem of intraluminal hair growth in male patients. Moreover, compared to the PMMC flap, a PMMF flap provides a swift reconstruction that is inherently less bulky and more pliable, theoretically facilitating flap inset, which could reduce the risk for potential salivary leakage or strictures.

Stricture rates did not differ significantly between the groups in the current study (PMMC 22%, PMMF 15%). Although sparsely reported in the literature, PMMC and PMMF stricture rates range from 0%–17% and 2%–43%, respectively, which is in line with the current study.^{4,7,14-18} Theoretically, reduction of tissue bulk due to the absence of a skin island in PMMF flaps may inherently lead to a larger neo-hypopharyngeal lumen, related to the increased pliability, as previously described by Saussez et al. for circumferential hypopharyngeal defects.¹⁹ Consequently, a PMMF flap reconstruction potentially has a lower chance of stricture development, but current data have not yet corroborated this hypothesis.

Despite the popular use of pectoralis major flaps over the past decades, few data are available on the associated donor-site morbidity. In a review by Kim et al., a pooled complication rate of 4% (77 out of 1751 patients) at the PMMC donor-site was reported.²⁰ The most common complications included wound dehiscence (0.7%–7%), infection (4%–11%), hematoma/seroma (1%–7%), and shoulder dysfunction (0%–71%).²⁰ Unlike in PMMC flaps, there is no need to include a chest skin island in PMMF flaps, which in turn facilitates more effortless wound closure and limits the risk of wound healing complications such as dehiscence. However, in our study, no significant differences in individual donor-site complications were observed (PMMF 15%, PMMC 20%).

Treatment choice: comparison with free flap reconstructions

Currently, the choice of reconstruction of a partial hypopharyngeal defect is predominantly based on institutional preferences and prior experiences, causing substantial heterogeneity in the treatment of patients.² This arbitrariness is illustrated by the fact that some institutions advocate the use of free flaps instead of regional flaps,

whereas some still consider a pectoralis major flap as a valid first choice of reconstruction.^{2,8-11,21} Remarkably, few data on free flap reconstructions are available. In the literature, pooled rates of fistulas (management unspecified) and strictures are 9% (95% CI 3-25%) and 13% (95% CI 5-29%) for anterolateral thigh free flaps, and 15% (95% CI 7-31%) and 3% (95% CI 0-88% for radial forearm free flaps, respectively.² The current study shows comparable complication rates following technically less demanding PMMF reconstructions, although future comparative studies are required to confirm this. Taking these favorable complication rates for PMMF reconstructions into account, we consider the use of a PMMF flap as a reliable alternative to a free flap to reconstruct partial hypopharyngeal defects.

Limitations and future research

There are limitations to the current study. First, the study design and the choice of reconstruction without randomization inherently lead to confounding by indication. As observed at baseline, PMMF reconstructions were performed significantly more often in female patients and in patients with a higher BMI, which are both correlated with the bulkiness of a PMMC flap. Moreover, patients that received a PMMF flap required adjuvant chemotherapy significantly more often compared to those in that received a PMMC flap. Considering the potential negative effects of these confounding factors on the occurrence of complications, the results of our study might even favor PMMF flap reconstructions, if both groups were comparable at baseline. Nonetheless, its use in a broader setting for all patients (e.g., with more favorable lower BMI) should be investigated further. Second, only three studies on PMMF reconstructions currently exist in the literature, decreasing our study's external validity compared to its more prevalent PMMC counterpart. In spite of this shortcoming in the literature, all current PMMF studies have unambiguously shown clear advantages over PMMC reconstructions, setting the precedent for its broader use and consideration as a primary choice for the reconstruction of partial hypopharyngeal defects.

Future studies should further investigate the use of PMMF flaps compared to PMMC and free flap reconstructions to determine which technique leads to superior surgical outcomes and quality of life. Furthermore, no studies have investigated differences in outcomes between types of inner lining, with the exception of the small case series by Robertson and Robinson in which no clinical difference between either inner lining type was observed.⁷ Studies comparing the use of different inner lining techniques (e.g., skin island/paddle, split-thickness skin graft, or solely myofascial) should be performed. Ideally, a multicenter (inter)national prospective study using standardized outcome parameters could provide a treatment algorithm for patients based on predictive factors, which may result in better outcomes including a better quality of life for future patients.

Conclusion

A PMMF flap with split-thickness skin graft inner lining provides a reliable and swift reconstruction of the hypopharynx

following TLE with partial hypopharyngectomy and holds inherent reconstructive advantages over a traditional PMMC flap. While avoiding notorious drawbacks of the conventional PMMC flap, including tissue bulk, poor pliability, and donor morbidity, PMMF flap reconstructions yield promising results and significantly outperform the former in terms of postoperative morbidity with lower rates of suture line leakage. Although the final choice for any partial hypopharyngeal reconstruction should be patient-tailored, the PMMF flap appears to be a non-inferior alternative to PMMC flap reconstructions. Consequently, we consider the use of a PMMF flap as a reliable primary reconstructive choice for partial hypopharyngeal defects.

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Ethical approval

The institutional medical ethics committee approved the study prior to the start of the data collection.

Declaration of Competing Interest

None.

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