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Flap Survival and Surgical Outcomes Following Pectoralis Major Myocutaneous Flap Reconstruction of Head and Neck Oncological Defects: A Prospective Study.

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Abstract

Background: Pectoralis major myocutaneous flap reconstruction remains an option for selected head and neck oncological defects. Evaluation should distinguish complete flap survival from partial necrosis, wound morbidity and functional recovery. Aim: To evaluate flap survival and surgical outcomes following PMMC reconstruction of head and neck oncological defects. ***Methods***: A prospective observational cohort of 100 evaluable adult patients was at a tertiary-care institution. Complete flap survival at day 30 was the primary outcome. Complications, reoperation, postoperative hospital stay and oral intake were assessed through 90 days. The sample size was based on an assumed complete-survival proportion of 90%, 95% confidence and 6% absolute precision. The following results are calculations, not observations from enrolled patients. ***Results***: Mean age was 54.7 (10.8) years, and 82.0% were male. Complete survival was 90.0% (95% CI 82.6-94.5), partial necrosis 8.0% and total flap loss 2.0%. Retention without total loss was 98.0% (95% CI 93.0-99.4). Any reconstructive complication occurred in 30.0%, and 8.0% required reoperation. The complication group had a 9.20-day longer mean hospital stay (95% CI 6.57-11.83) and a 7.60-day delay in first oral intake (95% CI 5.38-9.82), both $p < 0.001$. Hypoalbuminaemia (RR 2.67), previous radiotherapy (RR 2.29) and diabetes (RR 2.00) had nominally significant unadjusted associations with complications. Feeding-tube independence at day 90 was 92.0%. ***Conclusion***: The example demonstrates how high flap retention may coexist with clinically important morbidity. Actual prospective data are required before drawing conclusions about local outcomes or associated risk factors.

Keywords: Pectoralis major myocutaneous flap; Head and neck neoplasms; Postoperative complications.

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INTRODUCTION

Reconstruction following head and neck cancer resection aims to restore tissue continuity, protect exposed structures and support swallowing, speech and appearance. Extensive resections may produce defects involving oral mucosa, facial skin and adjacent soft tissues, making reconstruction an important component of multidisciplinary oncological treatment. The pectoralis major myocutaneous (PMMC) flap remains an established regional reconstructive option. Its vascularized muscle and skin can provide coverage without microvascular anastomosis, although flap bulk, restricted reach and donor-site morbidity influence its suitability. Tripathi et al. (2015)[1] reported their experience with 100 reconstructions and demonstrated that satisfactory flap retention could coexist with appreciable postoperative morbidity. Bhanja et al. (2016)[2] examined its use in oral cancer reconstruction in a resource-constrained setting, highlighting its practical role where microsurgical resources or patient suitability limited free-tissue transfer. Anehosur et al. (2020)[3], in a series of 150 patients, reported wound dehiscence, fistula, infection and partial skin-margin necrosis despite the absence of total flap failure. Such observations emphasize that survival alone provides an incomplete assessment of reconstructive success. Patient-related and treatment-related factors also deserve attention. Shanmugam et al. (2020)[4] identified associations of low serum albumin, previous radiotherapy and larger bipaddled flaps with postoperative complications, supporting systematic documentation of nutritional status, treatment history and defect characteristics. Choudhury et al. (2023)[5] described continued indications for pectoralis major reconstruction in patients with major comorbidities, extensive disease, unsuitable recipient vessels, financial constraints or previous free-flap failure. Nevertheless, findings across centres are difficult to compare because definitions of flap necrosis, complication severity, salvage surgery and follow-up differ. Prospective collection using explicit outcome definitions can distinguish complete survival from survival with partial tissue loss and quantify the recovery burden associated with complications. The study therefore evaluates flap survival,

postoperative complications and surgical recovery in 100 patients undergoing PMMC reconstruction of head and neck oncological defects, while exploring associations with selected baseline and operative characteristics.

AIM

To evaluate flap survival and surgical outcomes following pectoralis major myocutaneous flap reconstruction of head and neck oncological defects.

OBJECTIVES

1. To determine complete flap survival, partial flap necrosis and total flap loss within 30 postoperative days.
2. To assess recipient-site and donor-site complications, reoperation, hospital stay and recovery of oral intake up to 90 days.
3. To explore associations of selected patient, treatment and operative characteristics with postoperative reconstructive complications.

MATERIALS AND METHODS

Source of data

Data were collected prospectively from consecutive eligible patients undergoing oncological resection and PMMC flap reconstruction. Sources included patient interviews, preoperative assessments, operative and anaesthesia records, pathology reports, inpatient monitoring charts and follow-up assessments. A standardized case-record form was completed at baseline, during hospitalization and at scheduled follow-up visits. Each patient received a unique study identifier.

Study design

The study was designed as a hospital-based prospective observational cohort. Selection of PMMC reconstruction was determined by the treating multidisciplinary team according to the defect, patient fitness, available recipient vessels and reconstructive resources. Reconstruction was not allocated randomly. Comparisons between patients with and without complications were exploratory analyses within the cohort and did not represent randomized treatment groups.

Study location

The study was conducted in the Departments of Head and Neck/Surgical Oncology and Plastic and Reconstructive Surgery at [institution name, city, state]. The centre's referral population, availability of microsurgery and indications for choosing PMMC reconstruction were documented to aid interpretation of selection effects.

Study duration

The study period was 24 months, comprising 21 months of recruitment followed by completion of 90-day follow-up for the final participant. The actual recruitment dates were [start date] to [end date], and final follow-up ended on [date]. These durations and dates were placeholders requiring confirmation against the approved protocol and achievable recruitment rate.

Sample size

The sample size was calculated to estimate the proportion with complete flap survival at postoperative day 30:

$n = Z^2_{(1-\alpha/2)} \times p \times (1 - p) / d^2$

Here, n represented the required evaluable sample, Z = 1.96 for a two-sided 95% confidence level, p = 0.90 was an explicitly assumed planning proportion of complete flap survival, and d = 0.06 was the desired absolute precision of six percentage points. The value of p was a planning assumption, not an estimate attributed to a particular published study, because definitions of complete survival differ across reports.

$n = (1.96^2 \times 0.90 \times 0.10) / 0.06^2 = 96.04$

The minimum evaluable sample was rounded upward to 97 patients; the target was rounded to **100 evaluable patients**. This was a precision-based calculation and did not use an 80% power assumption. It was not designed to establish predictors of rare total flap loss. If 10% loss to primary-outcome assessment was anticipated, approximately 112 patients would need recruitment to retain 100 evaluable patients: $N = \text{ceiling}[100/(1 - 0.10)] = 112$. If recruitment remained capped at 100, attrition would reduce achieved precision and would be reported rather than concealed through post-enrolment exclusion.

Sampling technique

Consecutive patients meeting eligibility criteria were approached during the recruitment period. A screening log recorded eligibility, non-participation and reasons for exclusion. Only the first eligible PMMC reconstruction per patient was included as the index procedure; subsequent procedures were recorded as outcomes.

Inclusion criteria

1. Adults aged 18 years or older with histologically confirmed head and neck malignancy.

2. Patients undergoing resection of a primary or recurrent tumour, or reconstruction of an oncological defect after failure of a previous reconstruction, using a PMMC flap.
3. Patients able to provide informed consent and participate in planned follow-up.
4. Patients receiving a PMMC flap containing both pectoralis major muscle and a cutaneous paddle, including single-paddle or bipaddled configurations.

Exclusion criteria

1. Reconstruction for non-oncological trauma, burns or benign disease.
2. Reconstruction using only a muscle or myofascial pectoralis flap without a skin paddle.
3. Use of a different reconstructive flap without a PMMC component.
4. Previous donor-region surgery or vascular injury that precluded safe PMMC harvest.
5. Refusal to participate or inability to provide valid consent without an appropriate approved consent process.

Patients developing complications, undergoing reoperation, dying or missing follow-up after enrolment were not retrospectively excluded. Outcome availability and reasons for missing assessments were documented separately.

Procedure and methodology

Preoperative evaluation included age, sex, tobacco exposure, comorbidities, previous cancer treatment, nutritional assessment, body mass index, haemoglobin and serum albumin. Tumour site, histological diagnosis, clinical stage and anticipated defect were documented. Hypoalbuminaemia was defined as serum albumin below 3.5 g/dL. Diabetes mellitus was recorded from a documented diagnosis or ongoing treatment. Previous radiotherapy referred to irradiation involving the operative recipient region. Tobacco exposure was recorded as current or former use, with product, duration and cessation date retained in the source records. Patients underwent anaesthetic evaluation and appropriate preoperative optimization. Nutritional and glycaemic management followed institutional practice. The reconstructive team documented whether PMMC was used for immediate reconstruction at the index resection or as salvage reconstruction. Salvage after recurrent tumour resection and salvage after failed free-tissue transfer were recorded separately; they were not assumed to be equivalent clinical situations. Following tumour excision, the location and dimensions of the defect were measured. The flap was planned according to the required lining, coverage and tissue volume. The skin paddle was supported by underlying muscle and the vascular pedicle was protected during harvest and transfer. Flap transfer and inset were documented, including the transfer route, donor side, paddle configuration and any intraoperative concern about tension or perfusion. These descriptions were adapted to the procedure actually performed and did not prescribe a uniform technical modification for every patient.

Operative duration was defined as the interval from initial incision to completion of closure for the full oncological and reconstructive procedure. Skin-paddle area was documented in square centimetres using a prespecified measurement method, with both paddles included for bipaddled flaps. Estimated blood loss, transfusion, drain placement, donor-site closure and adjunctive procedures were recorded. Inpatient care included clinical assessment of flap colour, temperature, capillary refill and wound condition, with escalation according to the surgical team's assessment. Monitoring frequency and treatment of complications followed the institutional protocol and were documented. Patients were assessed before discharge and at postoperative days 7, 14, 30 and 90, with additional visits when clinically indicated. Oral intake was introduced following assessment of wound integrity and swallowing safety. Time to oral intake denoted the first postoperative day on which clinically approved oral feeding commenced; it did not necessarily indicate full nutritional independence. Hospital stay was measured from the index operation to discharge. Feeding-tube independence at day 90 was assessed separately. Shoulder symptoms and rehabilitation were documented clinically; formal conclusions about shoulder function required a validated instrument and baseline measurement.

Outcome definitions

The primary outcome was complete flap survival at day 30, defined as survival of the entire transferred flap without clinically evident partial or total necrosis. Partial necrosis indicated loss of part of the skin paddle and/or underlying tissue with some viable flap remaining. Total flap loss indicated non-viability of the transferred flap requiring abandonment or replacement. These three categories were mutually exclusive. Flap retention without total loss combined complete survival and partial necrosis and was reported as a separate secondary measure.

A patient was classified as having any reconstructive complication if at least one episode of partial/total necrosis, recipient-site infection, clinically relevant wound dehiscence, salivary fistula, haematoma requiring treatment or donor-site wound complication occurred within 30 days. Multiple events in one patient were recorded separately, but the patient was counted only once in the composite outcome. Infection required documented clinical evidence and treatment; cultures were supportive rather than mandatory. Salivary fistula denoted clinically demonstrated salivary leakage through an abnormal tract. Reoperation meant an unplanned procedure under anaesthesia for a reconstructive complication. Mortality was reported separately and was not classified as uncomplicated flap survival without an assessment of the flap.

Sample processing

The study did not require an experimental biological sample. Venous blood collected for routine preoperative care was processed for the complete blood count and serum biochemical measurements according to the hospital laboratory's standard procedures. Assay methods, units and collection dates were documented. Resected tumour and nodal specimens were labelled and submitted for routine histopathological assessment. Wound material was sent for microbiological examination when infection was suspected. No additional research biopsy or molecular assay was assumed.

Data collection and quality control

Data were entered into a password-protected spreadsheet and checked against source records before analysis. Date fields, laboratory units and outcome definitions were standardized. Range checks and review of missing or inconsistent entries were performed. The patient-identification key was stored separately from the analytical dataset. Follow-up status was documented at each scheduled time point, and analysis denominators reflected the number assessed. The tables below assume complete assessment of all 100 patients; this assumption must be replaced by the actual participant flow.

Statistical methods

The planned analysis used IBM SPSS Statistics version 26 or equivalent validated software. Continuous variables were summarized as mean (SD) when appropriate; skewed measurements were additionally summarized using medians and interquartile ranges in the final analysis. Categorical variables were expressed as n (%). Wilson 95% confidence intervals were used for proportions and Student t intervals for means. Welch's independent-samples t test compared continuous measurements between patients with and without complications, with mean differences and 95% confidence intervals. Distributional adequacy was to be checked using patient-level data; it could not be established from summaries.

Pearson's chi-square test without continuity correction was used for categorical comparisons when expected counts were adequate; Fisher's exact test was reserved for sparse tables. Unadjusted risk ratios and log-method 95% confidence intervals summarized associations with the composite complication outcome. Tests were two-sided, with $p < 0.05$ treated as nominal statistical significance. Analyses of risk factors were exploratory, with no multiplicity adjustment, and were not interpreted as independent prediction or causation. No multivariable model of total flap loss was fitted because only two such events were assumed in the example. Descriptive tables did not receive artificial p values without a meaningful comparator or prespecified null hypothesis.

Ethical considerations

The final report required the actual institutional ethics committee name, approval number and date, and the documented consent procedure. The intended protocol included informed consent, confidentiality safeguards and clinical management independent of participation. Ethical approval or consent was not claimed as an accomplished fact in this template.

RESULTS

The following tables describe a cohort of 100 patients. All confidence intervals and comparison statistics were calculated from the displayed counts or summary measurements. They are demonstrations of reporting, not evidence from recruited patients.

Table 1: Baseline demographic and clinical characteristics (N = 100)

Characteristic	n (%) or mean (SD)	95% CI for percentage or mean
Age, years	54.7 (10.8)	52.56-56.84
Age ≥60 years	35 (35.0)	26.4-44.7%
Male sex	82 (82.0)	73.3-88.3%
Female sex	18 (18.0)	11.7-26.7%
Body mass index, kg/m²	21.8 (3.4)	21.13-22.47
Current/former tobacco use	72 (72.0)	62.5-79.9%
Diabetes mellitus	20 (20.0)	13.3-28.9%
Albumin <3.5 g/dL	30 (30.0)	21.9-39.6%
Previous radiotherapy	25 (25.0)	17.5-34.3%
Buccal mucosa/gingivobuccal complex primary	58 (58.0)	48.2-67.2%
Tongue/floor of mouth primary	18 (18.0)	11.7-26.7%
Oropharyngeal primary	14 (14.0)	8.5-22.1%
Laryngeal/hypopharyngeal primary	10 (10.0)	5.5-17.4%
Stage III/IV at current treatment assessment	84 (84.0)	75.6-89.9%

In this cohort, mean age was 54.7 (SD 10.8) years and 35.0% were aged at least 60 years. Men comprised 82.0%, and 72.0% reported current or previous tobacco use. Diabetes and hypoalbuminaemia were present in 20.0% and 30.0%, respectively; 25.0% had received previous radiotherapy. The buccal mucosa/gingivobuccal complex was the predominant primary site (58.0%), followed by the tongue/floor of mouth (18.0%). Stage III/IV disease accounted for 84.0%. These distributions describe the case mix and do not establish risk associations.

Table 2: Operative characteristics and recovery according to 30-day complication status (data)

Parameter	No complication (n = 70), mean (SD)	Any complication (n = 30), mean (SD)	Mean difference (95% CI)	Welch t	p value
Total operative duration, min	315.6 (58.4)	356.8 (65.2)	41.20 (13.48-68.92)	2.986	0.004
Skin-paddle area, cm²	64.8 (18.6)	82.4 (24.7)	17.60 (7.47-27.73)	3.501	0.001
Postoperative hospital stay, days	12.4 (3.1)	21.6 (6.8)	9.20 (6.57-11.83)	7.101	<0.001
Time to first oral intake, days	10.2 (2.8)	17.8 (5.7)	7.60 (5.38-9.82)	6.952	<0.001

Patients with complications had an mean operative duration of 356.8 minutes compared with 315.6 minutes among those without complications, a difference of 41.20 minutes (95% CI 13.48-68.92; p = 0.004). Mean skin-paddle area was larger in the complication group by 17.60 cm² (95% CI 7.47-27.73; p = 0.001). Complications were accompanied by a 9.20-day longer hospital stay and a 7.60-day delay in first oral intake, both with p < 0.001. These differences illustrate an association between complications and recovery burden; they cannot establish that operative time or flap size independently caused complications.

Table 3: Flap viability, complications and functional recovery (N = 100)

Outcome	n (%)	Wilson 95% CI, %
Complete flap survival without necrosis, day 30	90 (90.0)	82.6-94.5
Partial flap necrosis, day 30	8 (8.0)	4.1-15.0
Total flap loss, day 30	2 (2.0)	0.6-7.0
Flap retention without total loss, day 30	98 (98.0)	93.0-99.4
Any reconstructive complication, day 30	30 (30.0)	21.9-39.6
Recipient-site infection, day 30	12 (12.0)	7.0-19.8
Recipient-site wound dehiscence, day 30	10 (10.0)	5.5-17.4
Salivary fistula, day 30	7 (7.0)	3.4-13.7
Haematoma requiring treatment, day 30	4 (4.0)	1.6-9.8
Donor-site wound complication, day 30	6 (6.0)	2.8-12.5
Unplanned reconstructive reoperation, day 30	8 (8.0)	4.1-15.0
All-cause mortality, day 30	0 (0.0)	0.0-3.7
Oral intake without feeding-tube dependence, day 90	92 (92.0)	85.0-95.9

Complete survival without necrosis occurred in 90 patients (90.0%; 95% CI 82.6-94.5). Eight patients had partial necrosis and two had total flap loss, yielding 98.0% retention without total loss. At least one reconstructive complication affected 30.0%. Recipient-site infection occurred in 12.0%, dehiscence in 10.0%, salivary fistula in 7.0%, treated haematoma in 4.0% and donor-site wound complications in 6.0%. Eight patients required reoperation. No 30-day deaths were assumed, although the confidence interval remained compatible with a mortality proportion up to 3.7%. At day 90, 92.0% were hypothetically independent of feeding-tube support.

Table 4: Exploratory associations with any 30-day reconstructive complication

Exposure	Complications among exposed, n/N (%)	Complications among unexposed, n/N (%)	Unadjusted RR (95% CI)	Pearson χ^2 (df = 1)	p value
Albumin <3.5 versus ≥3.5 g/dL	16/30 (53.3)	14/70 (20.0)	2.67 (1.50-4.74)	11.111	0.001
Previous radiotherapy: yes versus no	13/25 (52.0)	17/75 (22.7)	2.29 (1.31-4.03)	7.683	0.006
Diabetes: yes versus no	10/20 (50.0)	20/80 (25.0)	2.00 (1.12-3.57)	4.762	0.029

Current/former tobacco use: yes versus no	24/72 (33.3)	6/28 (21.4)	1.56 (0.71-3.40)	1.361	0.243
Age ≥60 versus <60 years	13/35 (37.1)	17/65 (26.2)	1.42 (0.78-2.57)	1.308	0.253

Hypoalbuminaemia was associated with an complication risk of 53.3%, compared with 20.0% among patients with albumin ≥3.5 g/dL (RR 2.67; 95% CI 1.50-4.74; p = 0.001). Previous radiotherapy was associated with complication proportions of 52.0% versus 22.7% (RR 2.29; p = 0.006). Diabetes was associated with a twofold unadjusted risk (50.0% versus 25.0%; p = 0.029). Tobacco exposure and age ≥60 years were not statistically significant in these examples, but their wide confidence intervals did not exclude clinically relevant associations. These results must not be described as independent predictors.

DISCUSSION

Patient profile and applicability

The population in Table 1 was predominantly male, frequently tobacco-exposed and largely affected by advanced disease. This profile resembles the clinical settings in which PMMC reconstruction is commonly reported. Tripathi et al. (2015)[1] included predominantly oral cavity and oropharyngeal lesions, with advanced tumours representing a substantial proportion. Menezes et al. (2018)[6] reported 92 patients, 93.5% male, with a mean age of 61.39 years and predominantly stage IV disease. Their population was older than the cohort, underscoring that age, defect site and disease severity can differ substantially between centres. Direct numerical comparisons should therefore describe context rather than imply equal baseline risk.

Previous treatment deserves separate consideration. Wei et al. (2019)[7] found partial necrosis in 10.0% of primary PMMC reconstructions and 23.3% of salvage reconstructions following free-flap failure. Their definition of salvage was specific to failed free-tissue transfer. It should not be merged uncritically with salvage surgery for recurrent cancer. The 25 previously irradiated patients in Table 1 illustrate one component of treatment complexity; radiation history alone does not specify the indication for reconstruction or the full condition of the recipient bed.

Flap survival and postoperative morbidity

The principal distinction in Table 3 is between 90.0% complete survival without necrosis and 98.0% retention without total loss. This prevents partial tissue loss from being hidden within a single success percentage. Anehosur et al. (2020)[3] reported no total failure in 150 patients, but documented partial skin-margin necrosis in 8% and wound dehiscence in approximately 16%. Sharma et al. (2022)[8] also reported no total flap necrosis in 36 patients, while partial necrosis occurred in 16.6%; satisfactory eventual surgical outcome was achieved in 35 patients. These studies support reporting viability, wound events and eventual healing as separate outcomes rather than interchangeable measures of success.

The total-loss proportion of 2.0% had a 95% CI of 0.6-7.0%, showing considerable uncertainty despite a cohort of 100. Babu et al. (2025)[9] reported flap necrosis in 6% of 150 patients, infection in 8.6%, flap detachment in 10.7% and orocutaneous fistula in 3.3%. Their necrosis category should not be assumed equivalent to total flap loss in this template. The infection and fistula proportions of 12.0% and 7.0% were numerically higher, but differences in case mix, definitions and ascertainment preclude conclusions about comparative performance.

Soni et al. (2022)[10] examined complications across PMMC harvesting modifications. Their analysis highlights the importance of operative configuration and heterogeneity; pooled observations about modifications do not establish that one technique is universally preferable. The present template therefore requires documentation of paddle configuration and transfer route, even though a single overall viability table is presented.

Operative characteristics and recovery

In Table 2, patients with complications had larger flaps, longer operations, longer hospitalization and delayed oral feeding. Defect complexity could explain part of these relationships. Dhiwakar et al. (2023)[11] examined 110 reconstructions with distally positioned skin paddles and found that greater distal extension was associated with necrosis. Their work suggests that geometric positioning and tissue support can matter alongside total area. A larger area in isolation should therefore not be interpreted as the mechanism of tissue loss.

Nandy et al. (2024)[12] reported a 41.3% complication rate after bilobed PMMC reconstruction in 150 patients, with 6.6% requiring re-exploration and an average hospital stay of 11 days. Neville et al. (2022)[13] described 232 mango-shaped bipaddled reconstructions for extensive full-thickness defects and reported an overall complication rate of 33.8%. Jha et al. (2021)[14], in 100 patients, reported one total flap necrosis and identified wound infection and dehiscence among common complications. These series demonstrate that defect complexity and event definitions influence observed rates. The example's 30.0% composite complication proportion and 8.0% reoperation proportion are clinically plausible illustrations, not validated estimates for the centre.

The 9.20-day difference in hospital stay and 7.60-day delay in oral intake quantify the recovery burden. Because complication status was determined after surgery, neither comparison proves causation. Hospital discharge also depends on social circumstances, rehabilitation, nutrition and local pathways. Bhanja et al. (2016)[2] support the practical role of

PMMC reconstruction in resource-constrained care, but economic advantages cannot be inferred from the present example without collecting actual costs and an appropriate comparator.

Risk-factor interpretation

The associations with hypoalbuminaemia and prior radiotherapy align directionally with Shanmugam et al. (2020)[4], whose 285-patient analysis identified both factors as associated with flap complications. Serum albumin may reflect nutritional status, inflammation and disease burden, and its association does not prove that correcting the laboratory value alone prevents complications. Similarly, previous radiotherapy may coexist with recurrent disease, fibrosis, altered vascularity and larger resections. The RR estimates in Table 4 are consequently unadjusted associations and should not be labelled independent predictors.

The diabetes association also requires validation in the actual dataset, including documentation of glycaemic control. Non-significant findings for tobacco exposure and older age should not be interpreted as evidence that these factors are harmless. Exposure measurement was broad, and confidence intervals were compatible with meaningful risk increases. With only 30 composite events and two total flap losses in the example, an extensive prediction model would be unstable. The intended cohort is better suited to estimating outcome frequencies and generating hypotheses than to developing a definitive risk score.

Functional recovery and donor-site assessment

Feeding-tube independence in 92.0% at day 90 would be a useful practical outcome, but it would not establish normal swallowing, speech or quality of life. Donor-site wound healing also does not demonstrate preserved shoulder function. Refos et al. (2016)[15] identified additional shoulder morbidity after pectoralis major harvest, including impaired abduction. Sun et al. (2015)[16] found a small but significant deterioration in upper-extremity function after reconstruction, with flap size associated with postoperative DASH scores. These findings justify baseline and longitudinal assessment rather than reliance on informal complaints alone.

Rauchenwald et al. (2021)[17] reported generally favourable shoulder findings after a modified muscle-sparing technique, but only six patients underwent functional assessment, limiting generalizability. Anehosur et al. (2022)[18] prospectively compared patients undergoing modified radical neck dissection with and without PMMC reconstruction and described improvement with rehabilitation. The different findings across studies suggest that neck dissection, flap technique, measurement methods and physiotherapy all influence functional outcomes. Li et al. (2016)[19] evaluated patient-reported quality of life after tongue reconstruction, reinforcing the value of outcomes beyond flap viability. Falade et al. (2024)[20], in a systematic review, identified persistent limitations in shoulder movement, strength or activities in several studies and considered muscle-sparing variants potentially beneficial. The tables contain no validated shoulder or quality-of-life scores and cannot support claims of minimal functional morbidity.

Position of PMMC reconstruction in practice

Choudhury et al. (2023)[5] documented continued use of PM flaps for selected patients, including those with comorbidities, depleted recipient vessels or prior reconstruction failure. However, the present single-cohort template cannot establish superiority over free flaps. Gabrysz-Forget et al. (2019)[21] reviewed 30 comparative studies and found trade-offs across operative time, costs, revisions, infection and necrosis, with limitations arising from the underlying study designs. Aničin et al. (2015)[22] reported the utility of PMMC reconstruction in primary and salvage cancer surgery, while oncological outcomes differed between those clinical settings. Reconstructive survival must therefore remain distinct from cancer survival. A prospective cohort with standardized definitions can provide useful local estimates, but comparative effectiveness, long-term function and oncological outcomes require additional appropriately designed research.

CONCLUSION

In the cohort of 100 patients, complete flap survival without necrosis was 90.0%, while retention without total flap loss was 98.0%. Reconstructive complications affected 30.0% and were associated with longer hospital stay and delayed oral intake. Low serum albumin, previous radiotherapy and diabetes showed unadjusted associations with complications. These example findings illustrate the need to report flap viability, wound morbidity and recovery separately. They do not establish clinical effectiveness or predictors in actual patients. The final conclusion must be rewritten from the prospectively collected study results and should avoid claims of superiority over other reconstructive methods.

LIMITATIONS OF THE STUDY

1. A single-centre cohort would reflect local case selection, technical experience and resources, limiting generalizability.
2. Without a concurrent comparator, the study could not establish superiority, equivalence or cost-effectiveness relative to free or other regional flaps.
3. The precision-based sample of 100 would offer limited information about uncommon total flap loss and would not support a complex risk-prediction model.
4. Non-random selection, variable defects, previous treatment and salvage indications would introduce confounding.

5. Differences in paddle design, operative technique and postoperative care could influence outcomes unless carefully recorded.
6. Ninety-day follow-up would not adequately characterize long-term swallowing, shoulder disability, quality of life, oncological recurrence or survival.
7. Clinical assessments without blinded adjudication could introduce observer bias. Missing follow-up could also bias outcome proportions.
8. The example analyses are unadjusted and involve multiple comparisons; nominally significant findings require cautious interpretation.
9. No actual patient data underpin this draft. All numerical results are and cannot be submitted as observed research findings.

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