|| Print ISSN: 2958-3675 || Online ISSN: 2958-3683 ||

International Journal of Medical and Pharmaceutical Research (IJMPR)

Available Online at www.ijmpr.in

ORCiDID: 0000-0002-3849-6959

Volume 3, Issue 1; Jan-June 2022; Page No. 38-42

Original Article Open Access

Clinical Outcomes of Pectoralis Major Myocutaneous Flap in Head and Neck Reconstruction: A Prospective Study

Dr. Anuj Singh[1]; Dr. Annu Rajpurohit[2]

[1] Assistant Professor, Department of Surgical Oncology, National Institute of Medical Sciences & Research, Jaipur
[2] Assistant Professor, Department of Medical Oncology, National Institute of Medical Sciences & Research, Jaipur

A B S T R A C T

Background: Reconstruction following head and neck cancer surgery remains a major challenge. Although microvascular free flaps are considered the gold standard, resource limitations and technical expertise often make pedicled flaps, particularly the pectoralis major myocutaneous (PMMC) flap, the preferred option in many centers.

Objective: This study aimed to evaluate the outcomes, complications, and reliability of PMMC flap reconstruction in patients with head and neck cancers.

Methods: A prospective observational study was conducted at a tertiary care teaching hospital. Fifty patients with advanced head and neck malignancies requiring composite resections underwent reconstruction using PMMC flap. Patient demographics, tumor characteristics, surgical details, and postoperative outcomes were analyzed.

Results: Among 50 patients (36 males, 14 females; mean age: 54.3 years), oral cavity cancers were most common (72%), followed by oropharyngeal (14%), hypopharyngeal (8%), and laryngeal tumors (6%). PMMC flap was used for mucosal defect coverage in 40 patients, cutaneous coverage in 6, and combined defects in 4 patients. Flap-related complications occurred in 14 patients (28%), including minor partial necrosis (8%), major partial necrosis (4%), wound dehiscence (10%), and fistula formation (6%). No total flap loss was observed. Non-flap-related complications included hematoma (6%) and surgical site infection (12%).

Conclusion: PMMC flap remains a reliable and versatile reconstructive option in head and neck cancer surgery, particularly in resource-limited settings. Despite a moderate complication rate, flap survival was excellent, supporting its continued role as a workhorse flap in head and neck reconstruction.

Keywords: Head and neck cancer, PMMC flap, reconstructive surgery, surgical oncology, flap complications

***Corresponding Author**
Dr. Anuj Singh
Assistant Professor, Department of Surgical Oncology, National Institute of Medical Sciences & Research, Jaipur

INTRODUCTION

Head and neck cancers represent a significant global burden, particularly in low- and middle-income countries (LMICs). According to GLOBOCAN 2020 data, head and neck cancers account for nearly 890,000 new cases annually worldwide, with oral cavity cancers contributing to almost 50% of these cases (Bray et al., 2020). In India alone, head and neck malignancies constitute approximately 30–40% of all cancers, largely due to widespread consumption of tobacco, betel nut, and alcohol (Gupta et al., 2016). Surgical excision remains the mainstay of treatment for advanced-stage disease, but it often leaves behind complex composite defects involving mucosa, skin, and bone, significantly affecting patients' speech, swallowing, and appearance. Reconstruction of these defects is therefore critical not only for functional rehabilitation but also for social reintegration of patients.

Microvascular free tissue transfer has emerged as the gold standard for head and neck reconstruction. Free flaps such as radial forearm, anterolateral thigh (ALT), and fibula osteocutaneous flaps provide excellent cosmetic and functional outcomes due to their pliability, versatility, and ability to restore both soft tissue and skeletal continuity (Urken et al., 2018). However, these procedures require specialized surgical expertise, prolonged operating times, high-cost infrastructure, and reliable postoperative monitoring. In many high-volume cancer centers in LMICs, these resources are often unavailable or overstretched, limiting the routine use of free flaps.

In contrast, the pectoralis major myocutaneous (PMMC) flap, first described by Ariyan in 1979, continues to be a workhorse flap in head and neck reconstruction (Ariyan, 1979). It is based on the thoracoacromial artery and includes a skin paddle, subcutaneous tissue, and underlying pectoralis major muscle, making it robust, reliable, and relatively simple to harvest. The PMMC flap has several advantages: it provides well-vascularized tissue, is close to the surgical field, allows single-team surgery, requires minimal equipment, and has a short learning curve (McLean et al., 2010). Moreover, donor site morbidity is low compared to free tissue transfer, and the flap is particularly useful in medically compromised patients or those previously treated with radiotherapy.

Despite its advantages, PMMC flaps are not free of complications. Reported complication rates vary between 20% and 60%, with partial flap necrosis, wound dehiscence, fistula formation, and surgical site infection being the most common (Shah et al., 1990; Milenovic et al., 2006). Nonetheless, total flap loss is rare, and most complications can be managed conservatively or with minor secondary procedures. Interestingly, PMMC flaps are often used as salvage options following free flap failure, further emphasizing their relevance in the reconstructive armamentarium (Vartanian et al., 2004).

The continued use of PMMC flaps in modern surgical oncology highlights an important debate: whether free flaps should entirely replace pedicled flaps in all settings, or whether pedicled flaps still hold value in specific patient populations. In high-income countries with ready access to microsurgical expertise, PMMC usage has declined significantly. However, in countries with limited resources, high patient load, and a shortage of reconstructive surgeons, the PMMC flap remains indispensable. Furthermore, for advanced cancers requiring large resections or in patients with systemic comorbidities, PMMC continues to provide reliable outcomes with minimal risk of catastrophic failure.

Given this background, our study evaluates the outcomes of PMMC flap reconstruction in 50 patients undergoing head and neck cancer surgery at a tertiary care center. We aim to assess flap survival, complication rates, and overall reliability of PMMC flaps in a real-world resource-constrained setting. The findings of this study will contribute to the growing body of evidence on the continued relevance of pedicled flaps in the era of microvascular reconstruction.

METHODOLOGY

Study Design:

A prospective observational study conducted in the Department of Surgical & Medical Oncology at National Institute of Medical Sciences & Research, Jaipur.

Patient Selection:

- **Inclusion criteria:** Patients with histologically proven squamous cell carcinoma of the head and neck requiring surgical resection and reconstruction.
- **Exclusion criteria:** Patients unfit for major surgery, prior free flap reconstruction, or with incomplete data.

Sample Size: 50 consecutive patients.

Surgical Technique:

- Standard PMMC flap was harvested based on the thoracoacromial artery pedicle.
- Flap was tunneled subcutaneously into the neck to cover mucosal or cutaneous defects.
- Donor sites were closed primarily.

Data Collection:

Demographic details, tumor site, stage, type of resection, flap utilization, postoperative complications, and outcomes were documented.

Outcome Measures:

- **Primary:** Flap survival, partial or total necrosis, complication rate.
- **Secondary:** Donor site morbidity, hospital stay, and need for revision surgery.

Statistical Analysis:

Descriptive statistics were applied using SPSS v26.

RESULTS

Demographics and Clinical Profile:

- Mean age: 54.3 years (range 32–70 years).
- Male-to-female ratio: 2.6:1.
- Primary tumor sites: Oral cavity (72%), Oropharynx (14%), Hypopharynx (8%), Larynx (6%).
- Stage distribution: Stage III (36%), Stage IV (64%).

Flap Utilization:

- Mucosal defect coverage: 40 patients (80%)
- Cutaneous coverage: 6 patients (12%)
- Combined defects: 4 patients (8%)

Complications:

- Overall flap-related complications: 28%
  - Minor partial necrosis: 8%
  - Major partial necrosis: 4%
  - Wound dehiscence: 10%
  - Orocutaneous/pharyngocutaneous fistula: 6%
- No total flap loss recorded.
- Non-flap-related complications: hematoma (6%), infection (12%).

Table 1. Baseline Characteristics of Patients (n=50)

Characteristic	Value
Mean age (years)	54.3 (32–70)
Male : Female	36 : 14
Primary tumor site	Oral cavity (36), Oropharynx (7), Hypopharynx (4), Larynx (3)
Stage III	18 (36%)
Stage IV	32 (64%)

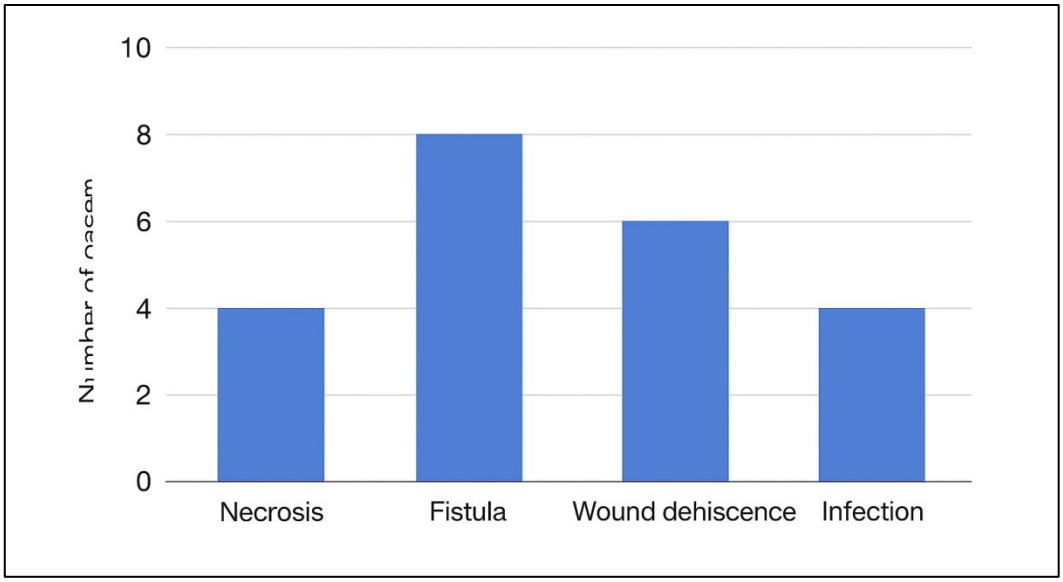

Figure 1. Distribution of PMMC Flap Complications

DISCUSSION

Our study demonstrates that PMMC flap reconstruction remains a reliable method for head and neck cancer defects, with satisfactory survival rates and acceptable complications. In our series, no total flap necrosis was observed, and major complications were limited to 4% of cases, which aligns with previously reported ranges (Milenovic et al., 2006; McLean et al., 2010).

The oral cavity was the most common site reconstructed, reflecting the epidemiology of head and neck cancers in India, where buccal mucosa and tongue cancers are prevalent due to tobacco use. Although free flaps provide superior functional outcomes, PMMC flaps are advantageous in centers with limited resources due to shorter operative time and lower cost (Vartanian et al., 2004).

Complication rates in our cohort (28%) were slightly lower than earlier studies reporting 40–50% (Shah et al., 1990). This may be attributed to careful patient selection, standardized surgical technique, and better perioperative care. Importantly, despite moderate morbidity, flap survival was excellent, reaffirming its role as a dependable option for reconstructive surgeons.

CONCLUSION

The PMMC flap continues to be a versatile and dependable reconstructive option in head and neck surgery. With excellent flap survival and manageable complication rates, it remains the workhorse flap in resource-limited settings where microvascular reconstruction is not feasible.

Acknowledgement

The authors thank the Department of Surgical Oncology, [Institution Name], for institutional support and all patients who consented to participate in this study.

Conflict of Interest

The authors declare no conflict of interest.

REFERENCES

1. Ariyan, S. (1979). The pectoralis major myocutaneous flap: A versatile flap for reconstruction in the head and neck. *Plastic and Reconstructive Surgery, 63*(1), 73–81.

2. Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2020). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians, 70*(4), 313–331.
3. McLean, J. N., Carlson, G. W., & Losken, A. (2010). The pectoralis major myocutaneous flap revisited: A reliable technique for head and neck reconstruction. *Annals of Plastic Surgery, 64*(5), 570–573.
4. Milenovic, A., Virag, M., Uglesic, V., & Aljinovic-Ratkovic, N. (2006). The pectoralis major flap in head and neck reconstruction: First 500 patients. *Journal of Craniomaxillofacial Surgery, 34*(6), 340–343.
5. Shah, J. P., Haribhakti, V., Loree, T. R., & Sutaria, P. (1990). Complications of the pectoralis major myocutaneous flap in head and neck reconstruction. *American Journal of Surgery, 160*(4), 352–355.
6. Urken, M. L., Persky, M. S., & Lawson, W. (2018). Principles of head and neck reconstruction. *Head & Neck Surgery*, 40(3), 482–490.
7. Vartanian, J. G., Carvalho, A. L., Carvalho, S. M., Mizobe, L., Magrin, J., & Kowalski, L. P. (2004). Pectoralis major and other myocutaneous flaps in head and neck cancer reconstruction: Experience with 437 cases at a single institution. *Head & Neck, 26*(12), 1018–1023.

