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VERSATILITY OF PECTORALIS MAJOR MYOCUTANEOUS FLAP IN RECONSTRUCTION OF DEFECT FOLLOWING HEAD AND NECK MALIGNANCY SURGERY.

Otorhinolaryngology

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ABSTRACT

Background: The pectoralis major myocutaneous flap (PMMF) is useful in head and neck reconstruction. Due to its ready availability, ease of harvest and reliability, it soon became the choice of reconstruction for post-ablative defects in the head and neck region. The present study was done at tertiary care center with the objective to study indications, complications & surgical outcomes of PMMC flap for reconstruction of defect following head and neck malignancy surgery. **Methods:** In this prospective study of two years, done in a tertiary care hospital of India, 60 patients with head and neck malignancy requiring PMMC Flap for reconstruction after ablative surgery were analyzed. **Results:** Majority of the patients (53.3%) were from the age group of 41-60 years with the mean age of the patients was 54.83 ± 12.59 years. Most of the patients were (76.7%) male. Flap complications were seen in 16 (26.7%) patients. Major flap morbidity was seen in 5 (8.4%) patients while 11 (18.3%) patients experienced minor complications. 44 (73.3%) patients had no complications. **Conclusion:** It can be concluded from present study that PMMF flap remains a very versatile technique with proven reliability for soft tissue coverage of most of the defects following major ablative head and neck surgeries.

KEYWORDS

pectoralis major myocutaneous flap (PMMF), Head & neck ablative surgery, Flap complications.

INTRODUCTION:

Area of head and neck surgery that has undergone the most advancement in the past 25 years is reconstruction. Today, there is almost no defect that cannot be repaired, which this has afforded the ablative surgeon more leeway in obtaining tumor free margins.

The pectoralis major myocutaneous flap (PMMF) is useful in head and neck reconstruction. The extent of coverage and the reach of the flap are dependent on the anatomy of the patient but the upper limits are generally considered the zygomatic arch externally and the tonsillar bed internally. Due to its ready availability, ease of harvest and reliability, it soon became the choice of reconstruction for post-ablative defects in the head and neck region.

Reconstruction of the head and neck is challenging due to the variety of tissues whose structural deficiencies must be corrected. This is because the defects include a variety of structures: skin, mucosa, soft tissue, and bone. In particular, the anatomy of the oral cavity is complicated, and each structure plays a specific role in speech, swallowing, and facial expression. In addition, defects in one specific functional unit can affect adjacent structures. [1-3]

PMMC flap is the principal mode of reconstruction following composite resections. It provides required bulk for a composite defect with acceptable cosmetic outcomes. [4] The present study was done at tertiary care center with the objective to study indications, complications & surgical outcomes of PMMC flap for reconstruction of defect following head and neck malignancy surgery.

MATERIALS AND METHODS:

This was a facility based prospective observational study, done in the department of Otorhinolaryngology on patients attending OPD/IPD at tertiary care center on all head and neck malignancy patients requiring PMMC Flap for reconstruction after ablative surgery attending OPD/IPD after due permission from the Institutional Ethics Committee and Review Board and after taking Written Informed Consent from the patients.

Present study included 60 patients to analyze versatility of pectoralis major myocutaneous flap in reconstruction of defect following head and neck malignancy surgery. Sampling method used was universal. Study was carried out over a period of 2 years from September 2013 to August 2015. Patients who were not suffering from head and neck malignancy but requiring PMMC flap for reconstruction due to other causes, patients who did not fit for surgery & head neck malignancy patients whose defect reconstructed using other flaps were excluded.

Once the patients were enrolled for the study, a thorough history and physical examination was done as per proforma. A specially designed Performa was used to collect the data that included patient particulars, ENT examination findings, baseline investigation, anesthesia details, intra operative findings and follow up for assessment of complications and outcome. The data collected was then analyzed by using SPSS IBM version 20.

RESULTS:

In the present prospective study, there was no lost to follow up and we could analyze all 60 patients giving the response rate of 100%. In this study youngest patient was of 21 years and eldest was of 80 years. Majority of the patients 53.3% were from the age group of 41-60 years followed by 33.24% from the age group of 61-80 years and least i.e. 13.33% from the age group of 21-40 years.

The mean age of the patients was 54.83 ± 12.59 years. Majority of the patients were (76.7%) male while female patients constituted 23.3% of the study group. Most patients i.e. 46 (76.6%) had locally advanced T4 disease and 13 (21.7%) had T3 and 1 (1.7%) patient had T2 tumors. On histopathology we have seen that the tumors was squamous cell carcinoma in 59 (98.3%) patients and adenoid cystic carcinoma in 1 (1.7%) patient of parotid malignancy (Table 1).

Table 1. Distribution of patients according to baseline characteristics.

Sr. No.	Baseline characteristic		Frequency (no.)	Percentage (%)
1	Age groups	<21-40	08	13.33
		41-60	32	53.33
		61-80	20	33.34
2	Gender	Male	46	76.7
		Female	14	23.3
3	T stage	T1	0	0
		T2	1	1.7
		T3	13	21.7
		T4	46	76.6

4	Histopathology	Squamous cell carcinoma	59	98.3
		Adenoid cystic carcinoma	01	1.7

The most commonly involved site was buccal mucosa noted among 37 (61.5%) followed by tongue in 13 (21.7%), retromolar trigone in 5 (8.3%), floor of the mouth in 2 (3.4%), parotid in 1 (1.7%), palate in 1 (1.7%) and larynx in 1 (1.7%). (graph 1)

Graph 1: Distribution of patients according to Site Involved

Flap complications were seen in 16 (26.7%) patients. Major flap morbidity was seen in 5 (8.4%) patients while 11 (18.3%) patients experienced minor complications. 44 (73.3%) patients had no complications. Of the major complications, 3 (5%) patients developed hematoma while 1 (1.7%) patient each developed partial flap necrosis and total flap loss. Of the minor complications, 4 (6.6%) patients each developed minor orocutaneous fistula and minimal suture line dehiscence while 2 (3.3%) and 1 (1.7%) patient developed marginal flap necrosis and infection respectively. (Table 2)

Table 2. Distribution of patients according to Flap complications. (N=60)

Complications		No.	%
Major	Hematoma	3	5
	Partial flap necrosis	1	1.7
	Total flap loss	1	1.7
Minor	Minor orocutaneous fistula	4	6.6
	Minimal suture line dehiscence	4	6.6
	Marginal flap necrosis	2	3.3
	Infection	1	1.7

On post-operative day 10, 20 (33.3%) patients had pain at donor site while 10 (16.7%) and 4 (6.7%) patients had discharge due to infection at donor site and difficulty in movement of shoulder respectively. 1 (1.7%) patient had total flap loss where defect was repaired with latissimus dorsi myocutaneous flap. After 1 month postoperatively 5 (8.3%) patients had pain at donor site while 4 (6.7%) and 2 (3.3%) patients had discharge at donor site and difficulty in movement of shoulder respectively. 1(1.7%) patient had partial flap loss where defect was repaired with deltopectoral flap. Flap showed discharge due to infection in 4 (6.6%) after 2 months postoperatively, 2 (3.3%) patients had pain at donor site while 1 (1.7%) patient had discharge at donor site.

After 3 months postoperatively the condition of flap was healthy in 58 (96.6%) patients and flap showed discharge due to infection in 1 (1.7%) patient and1 (1.7%) patient had pain at donor site. There was significant improvement during post-operative follow-up period as per Chi-Square test ($p<0.05$). (Table 3)

Table 3: Post-operative Follow-up in patients.

Parameters	Day 10		1 month		2 months		3 months		4 months		p
	N	%	N	%	N	%	N	%	N	%	
Pain at Donor Site	20	33.3	5	8.3	2	3.3	1	1.7	0	0	<0.05
Infection at Donor site	10	16.7	4	6.7	1	1.7	0	0	0	0	
Difficulty in movement of shoulder	4	6.7	2	3.3	0	0	0	0	0	0	
Condition of flap	Discharge	10	16.7	0	0	0	0	0	0	0	0
	Healthy	49	81.6	55	91.6	58	96.6	58	96.6	58	96.6
	Partial flap loss	0	0	1	1.7	0	0	0	0	0	0
	Total flap loss	1	1.7	0	0	0	0	0	0	0	0

DISCUSSION:

A hospital based prospective, observational study was conducted with 60 patients to analyse versatility of pectoralis major myocutaneous flap in reconstruction of defect following head and neck malignancy surgery, to study clinico-pathological profile of patients, to study indications, complications and outcome of pectoralis major myocutaneous flap (PMMF) reconstruction. In our study youngest patient was 21 years and eldest was 80 years old with the most common age group of 41-60 years. This is consistent to the study of Shanmugam S et al**[5]** Sharma S et al**[6]** found age distribution from 34 to 74 years and Miller LE et al**[7]** found age distribution from 45 to 60 years. There was a male preponderance (76.7%) in our study which is comparable to the studies of Tripathi M et al**[8]** who observed 77% male and 23% were female & Miller LE et al[7] who noticed male in 82.5% and female in 17.5% cases. This can be explained by the fact that male are more prone for malignancies of the upper aero-digestive tract probably due to their habit of smoking and tobacco chewing.

In present study, 76.6% patients had locally advanced T4 disease and 21.6% patients had T3 tumour, this is in line with the studies of Shanmugam S et al**[5]** who observed 68.4% patients with T4 disease, 24.2% Patients with T3tumours.TripathiM et al[8] noticed 55% patients with T4 and 30% patients with stage T3 tumours. It was observed in the present study that the most common histopathology type of tumours was squamous cell carcinoma in 98.3% patients which is comparable to study of Shanmugam S et al**[5]**; in which squamous cell carcinoma finding was in 97.8%. The most commonly involved site in the present study was buccal mucosa (61.5%) which is comparable to study of Shanmugam S et al**[5]** & McLean J N et al.**[9]**

In present study, most common major complication was hematoma at flap site in 5% patients which is comparable to studies of Anehosur V et al,**[4]** who reported 3% patients with hematoma at flap site and Tripathi M et al**[8]** who reported 7% patients with hematoma at flap site. Shanmugam S et al**[5]** observed partial Flap loss as major complication in 8% patients. While most common minor complications seen were orocutaneous fistula and wound dehiscence in 6.6% cases. Shanmugam S et al**[5]** observed orocutaneous fistula in 10.1% cases as most common minor complication and Anehosur V et al[4] noticed wound dehiscence in 16% patients as most common minor complication & Tripathi M et al**[8]** noticed infection as most common minor complication in 32% cases. (Table 4)

Table 4. Comparison of complications with other studies.

Study	Most common major complication %
TripathiM et al87	Hematoma (7%), Infection (32%)
Shanmugam Setal92	Partial flap loss (8%), Minor orocutaneous fistula (10.1%)
Anehosur Vet al12	Hematoma (3%), Wound dehiscence (16%)
Present study	Hematoma (5%), Minor orocutaneous fistula (6.6%), Wound dehiscence (6.6%)

In present study in follow up period percentage of flap survival is 96.6% which is comparable with study of Sumarroca A et al**[10]** where percentage of flap survival was 94%, While Sharma S et al**[6]** study observed survival of flap was in all 100%. Shanmugam S et al**[5]** study observed survival of flap was 90.17% and Tripathi M et al**[8]** study observed flap survival was 90%.

CONCLUSION:

It can be concluded from present study that PMMF flap remains a very versatile technique with proven reliability for soft tissue coverage of most of the defects following major ablative head and neck surgeries.

Declaration:

There was no source of funding in our study and there was no any conflict of interest.

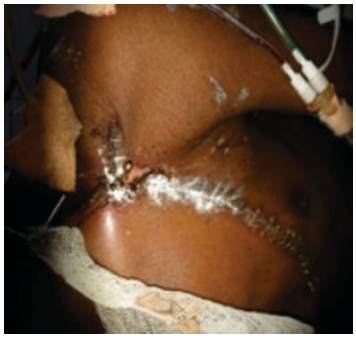

Image 14 : Discharge from donor site

Image 15 : Wound Dehiscence

Image 16 : Healthy PMM Fl

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