Pectoralis Major Myocutaneous Pedicled Flap: Our Experience

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Abstract
Background: The pectoralis major myocutaneous pedicle flap (PMMF) is still being used by plastic surgeons and plays an important role in head and neck reconstruction. Methods: The purpose of this series was to review our 5 years’ experience with the PMMF in head and neck reconstruction. Results: Forty two patients who underwent the PMMF technique were reviewed on the clinical records. In the 42 patients, there were 28 male and 14 female. The average age of the patients was 53 years. The PMMF was used to reconstruct floor of mouth in 30 patients, neck defects in 6 patients, esophagus in 2 patients, buccal mucosa in two patients and reconstruction of oral mucosal and cheek defect in 2 patients. Thirty four patients (80.90%) demonstrated no complication. Complications were noted in eight patients (19.10%). Total loss of skin paddle was seen in two patients (4.75%) and partial skin necrosis was shown in 4 patients (9.60%). Two patients (4.75%) had fistula formation. Conclusions: Without surgical expertise in or facilities for microvascular surgery, PMMF can be performed by reconstructive surgeons in head and neck reconstruction, and is still the “workhorse” flap for such reconstructions.

Keywords: Pectoralis Major Myocutaneous Pedicled Flap, Head and Neck Reconstruction, Flap Loss, Breast Disfigurement

INTRODUCTION

The pectoralis major myocutaneous pedicle flap (PMMF) is still being employed by many surgeons and plays an important role in head and neck reconstruction. As for the technique of harvesting the PMMF, the skin island needs to be designed principally medial to and at the level of the nipple. The pectoralis major muscle is freed from the underlying chest wall and subsequently a subcutaneous tunnel is created into the defect through which the PMMF is passed to the clavicular area. A reconstructive surgeon uses this technique because of its simplicity and less time consuming. Nevertheless, the surgeon who prefers the free flap believes that it not only achieves better functional and cosmetic results, but also has fewer donor-site morbidities, flap necrosis, fistula formation and others. We examined the versatility and complications of the PMMF technique based on our surgical experience.

PATIENTS AND METHODS

The study was conducted from November 2015 to December 2020 in the department of Plastic and Reconstructive Surgery GMC Srinagar. All the patients who underwent Head and Neck reconstruction by Pectoralis Major Myocutaneous flap, during this period were included in the study.

RESULTS

In the 42 patients, there were 28 male (mean age 55 years old; age range 27 - 72), and 14 female (mean age 50 years old; age range 35 - 70). The average age of the total patients was 53 years. The PMMF was used to reconstruct floor of mouth in 30 patients,
neck defects in 6 patients, esophagus in 2 patients, buccal mucosa in two patients and reconstruction of oral mucosal and cheek defect in 2 patients Table 1. The PMMF was applied to the right side of 26 patients and the left side of 18 patients.

### Table: Usage of flap

<table>
<thead>
<tr>
<th>Flap usage</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floor of mouth</td>
<td>30</td>
<td>71.44%</td>
</tr>
<tr>
<td>Neck</td>
<td>6</td>
<td>14.28%</td>
</tr>
<tr>
<td>Esophagus</td>
<td>2</td>
<td>4.76%</td>
</tr>
<tr>
<td>Buccal mucosa</td>
<td>2</td>
<td>4.76%</td>
</tr>
<tr>
<td>Buccal mucosa and cheek</td>
<td>2</td>
<td>4.76%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Forty patients (95.24%) received a radiation therapy after the PMMF technique. Thirty four patients (80.90%) demonstrated no complication. Complications were noted in eight patients (19.10%). Total loss of skin paddle was seen in two patients (4.76%) and partial skin necrosis was shown in 4 patients (9.58%). Two patients (4.76%) had fistula formation Table 2.

### Table 2: Complications

<table>
<thead>
<tr>
<th>Complication</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial skin necrosis</td>
<td>4</td>
<td>9.58%</td>
</tr>
<tr>
<td>Loss of skin paddle</td>
<td>2</td>
<td>4.76%</td>
</tr>
<tr>
<td>Fistula formation</td>
<td>2</td>
<td>4.76%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8</strong></td>
<td><strong>19.10%</strong></td>
</tr>
</tbody>
</table>

**DISCUSSION**

The most serious disadvantage of the PMMF technique is frequently an aesthetic disfigurement of the breasts for female patients. When the skin island is designed from the medial margin of the areola, the flap contains rich subcutaneous tissue and mammary glands. It is usually very bulky and, a breast deformity is often shown. The skin island must be designed, including the third intercostal perforating branch of the internal thoracic artery. This method made it possible to use a small and thin flap 15. However, if a case requires a large skin island, which must contain adequate blood supply, it must include the inner margin of the breast tissue. It is obvious that the larger skin island is used more deformity is expected on the breast postoperatively. The PMMF technique for female patients need to be, therefore, limited to only small defect repair.

Although the PMMF technique has got popularity after the original report of Ariyan, some surgeons reported disadvantage of this technique. 4,7 The major ones were unstable vascular circulation in the skin island, a partial necrosis tendency in comparison with the free flaps 16. The others reported that relatively large and clinically important perforating branch of the 4th intercostal vessel locating 2 - 3 cm medial to the nipple supplies adequate blood flow to the skin flap 17. It is
important to have an adequate size of a skin island of the PMMF with at least 90% or more, skin area directly on the pectoralis muscle. This design contains the 4th intercostal branch vessels within the skin island.

Despite having an adequately planned blood supply, 2 female and 1 male patient resulted in total necrosis of the skin island. Six patients among 102 patients (5.9%) demonstrated total or partial skin necroses. It is important to know that 5%-7% of patients receive the major blood supply to the entire pectoralis major muscle through the inferior pectoral artery 18. The PMMF technique does not, therefore, guarantee 100% success, probably due to the variation of the blood supply to the muscle.

The PMMF technique is shown difficult to be performed without postoperative complications, particularly in female patients. After the retrospective analysis of the complications, eight in forty two patients (19.10%) had some postoperative complications in the present study, which was slightly less than previously reports 8-12.

CONCLUSION

The “workhorse”, another name of the classical PMMF, can be easily employed frequently for the head and neck reconstruction. However, the surgeon must be well aware of the fact that this procedure has minor complications.

REFERENCES


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