

Letter to
Editor

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Importance of Pectoralis Major Myocutaneous Flap for Oro-Facial Defects in an Era Dominated by Free Tissue Transfer

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ABSTRACT

The pectoralis major myocutaneous flap (PMMCF) remains a crucial reconstructive tool for large oro-facial defects, particularly in regions with a high prevalence of oral cancer. It offers a reliable, cost-effective solution for oncological defects, with minimal complications. Surgeons must consider factors like flap design, proximity to the defect, and patient characteristics to optimize outcomes. Training in PMMCF is essential for head and neck surgeons. PMMCF continues to be invaluable in resource-limited settings, given the case burden on surgical teams.

Keywords: *Head and neck, oro-facial defects, pectoralis major myocutaneous flap*

Dear Editor,

The pectoralis major myocutaneous flap (PMMCF) remains a workhorse flap, which is quick and reliable for the majority of cases with large oro-facial defects in developing world. Oncological defects continue to be the most prevalent, due to significantly high burden of oral cancer in these regions. Buccal mucosa is the most common cancer subsite in Southeast Asia owing to the betel chewing habit (1). This short communication reiterates the importance of training head and neck surgeons, including oral and maxillofacial surgeons, otolaryngologists and oncological surgeons in this versatile flap early in their careers.

There are certain factors surgeons consider before deciding to perform a PMMCF for an oro-facial

defect.

- 1. Reliable design of the skin paddle, bulkiness/amount of fat overlying the pectoralis major muscle, and defect proximity to the reliable skin paddle**

Depending on the requirement of the defect, the design of the skin paddle varies. In my experience, most of the skin paddle area should be immediately superficial to the pectoralis major muscle territory. If the defect is higher up, placing the skin paddle design below the actual pectoralis major territory to achieve the arc of rotation can lead to unpredictable perfusion to the skin paddle. If newer imaging techniques with indocyanine are used, proper perfusion can be verified before flap



inset (2). However, in low-income countries with limited health care expenditure, this may be impractical.

Surgeons hesitate before performing a PMMCF in female patients due to the incorporation of breast tissue and a thicker fat layer; complication rates are expected to be higher in comparison to males. Similarly, a high Body Mass Index (BMI) in males with thick fat layers may also lead to more complications. In my experience, it is more reliable to harvest the skin paddle more medially in females, without disrupting lateral blood supply (avoiding lateral incisions) to the breast. A downside of this technique is limited arc of rotation. Also, deltopectoral flap sparing technique becomes a challenge.

Bulkiness of the flap can cause wound breakdown. It is important to have tension-free closure and to avoid tight sutures that constrict the pedicle and skin edges, that can have detrimental effects on the flap. There are reports of “Super Charging” the PMMCF with incorporation of lateral thoracic artery for anastomosis in the neck. But in the context of avoiding anastomoses and free flap transfer, due to financial and time constraints, supercharging would not be an option for improvement of reliability (3).

2. Through-and-through defect that requires replacement of both the mucosal aspect and skin

Bipaddle PMMCF is an option in these through-and-through defects. There is some controversy regarding the definition of a “true” bipaddle PMMCF, which can be interpreted as either taking two separate skin islands over the pectoralis major or one skin island with de-epithelialization to fold the flap (4-5). In my experience, in certain cases of through-and-through defects of the cheek, leaving the raw muscle of the pectoralis major intraorally, while reconstructing the skin externally with PMMCF skin, can be beneficial. The muscle will eventually become mucosalized, and it is crucial to achieve an oral seal by suturing the muscle edges to the mucosal edges, especially to separate the neck compartment. This will help to prevent any oro-cutaneous fistulae later.

3. Loss of mandible in the resection process, whether to bridge the gap or not?

There is the option of using reconstruction plates or ribs with the PMMCF to replace the lost mandible. In my experience, if hardware is integrated into the PMMCF, it can lead to increased infections and detachments. Ultimately, exposure of the reconstruction plate, either intra-orally or extra-orally will be a possibility, especially after radiotherapy in soft tissue-only reconstructions. This can lead to fistulae and a significant reduction in quality of life. However, if mandibular continuity is breached, the remaining mandible may deviate, affecting function. It is always possible to do a secondary bony reconstruction in young patients, after assessing long term cancer free survival.

4. Loss of lips and commissure in cancer resection

The most challenging areas to reconstruct with the PMMCF are the loss of the commissure and lips. Multiple revision surgeries may be necessary. An alternative is to use local lip flaps, such as Estlander flap or immediate commissuroplasty, to maintain lip competency (6). These procedures may minimize mouth opening, potentially hindering nutrition and complicating surveillance for recurrence during follow-up.

5. Possibility of complications in the donor site

It is prudent to place drains, along with meticulous haemostasis, to avoid haematoma at the donor site before closure. Continuous suturing at the cut edges of the remaining pectoralis major muscle in the chest will constrict the muscle edges and minimize bleeding. The larger the skin defect in the donor site, the more difficult it is to close it primarily without tension. Tighter closures in the chest increase the risk of wound dehiscence, potentially leading to more scarring or prolonged healing phases due to secondary intention healing.

There are reports emphasizing the incorporation of the nipple and areolar complex (in male) with the PMMCF when a large skin paddle is required (7). Even though this may raise aesthetic concerns, utilizing the full reliable portion of the skin immediately above (superficial to) the muscle can be advantageous. Some authors suggest re-grafting the nipple and areolar complex into the chest after PMMCF harvest (8).

6. Possibility of modified flap designs, depending on patient requirements and specific subsites

There are possibilities for prefabrication and prelamination of the pectoralis major flap for better functional and aesthetic outcomes (9,10). It should be individualized patient-specific planning; this may not always be possible in immediate reconstruction of oncological defects.

The aim of this short communication is to remind the importance of training reconstructive surgeons in the Sri Lankan community on the PMMCF, with few bullet points to brainstorm when using it. Undoubtedly, PMMCF remains a reliable and cost-effective option for oro-facial reconstruction in a developing-world setup, where there is an overwhelming workload of oral cancer.

Author declaration

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