

Pectoralis major myocutaneous flap for head and neck reconstruction: a case report



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ABSTRACT

Introduction: Cancer surgery in the head and neck area generally causes a wide defect and usually cannot be closed primarily or by using the surrounding tissue, thus a flap is needed. There are several types of flaps, namely local flaps, pedicle flaps, and free flaps. Although the free flap is currently the gold standard for reconstruction of the head and neck in developing countries, the resources for a free flap in most healthcare center are still lacking, as well as the large number of patients with poor economic and nutritional status. Thus, the pectoralis major myocutaneous flap (PMMF) remains popularly used.

Case Description: A 46-year-old male patient with squamous cell carcinoma in the neck area, underwent wide excision procedure and the surgical defect was reconstructed with a pectoralis major myocutaneous flap. The results of reconstruction with pectoralis major myocutaneous flap were viable, and were functionally and aesthetically acceptable. There are no postoperative complications such as hematoma or abscess observed.

Conclusion: Pectoralis major myocutaneous flap was one of the main and easy to learn modalities for head and neck reconstruction surgery and it was acceptable functionally and aesthetically in situations where free flap could not be performed for one or many reasons.

Keywords: Head and neck cancer, pectoralis major myocutaneous flap (PMMF), reconstruction, squamous cell carcinoma.

Cite This Article: Oktahermoniza, Oktavenra, A., Khambri, D. 2021. Pectoralis major myocutaneous flap for head and neck reconstruction: a case report. *Bali Medical Journal* 10(1): 164-166. DOI: 10.15562/bmj.v10i1.2112

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Received: 2020-12-08

Accepted: 2021-03-30

Published: 2021-04-24

INTRODUCTION

Extensive defects after head and neck surgery can sometimes be dreadful. Microvascular free flap reconstruction is currently the gold standard, because functionally and aesthetically better results can be obtained. However, it requires a lot of training and resources. The pectoralis major myocutaneous flap (PMMF) has excellent vascularization and is easy for surgeons to study. It is still a mainstay of healthcare centers with limited resources and large numbers of patients.³

The pectoralis major myocutaneous flap (PMMF) was originally developed in 1947 for reconstruction of cardiothoracic surgical defects. In 1979, Ariyan first reported the use of PMMF for reconstruction of the head and neck. Previously, the surgeons used deltopectoral and other localized flaps for reconstruction of the head and neck.⁴

The objective of this case report is to increase knowledge and demonstrate the advantages of a pectoralis major

myocutaneous flap for reconstruction of the head and neck region to obtain acceptable aesthetic output

CASE DESCRIPTION

A 46-year-old man presented with a diagnosis of left neck squamous cell carcinoma. The patient is prepared for wide excision under general anesthesia. Initially the patient complained of a lump on the left side of the neck for about 6 months. An incisional biopsy has been performed with histopathological results of squamous cell carcinoma. There were no abnormalities in the oral cavity, nose, ears, and throat during the physical examination. No enlargement of cervical lymph nodes was found. There were no other abnormalities found. Laboratory tests of the patient were within the normal limits.

A wide excision with frozen section was performed with a tumor-free incision margin and negative tumor neck lymph nodes. The defect after excision was 8 x

12 cm. It was decided to reconstruct the surgical defect with a pectoralis major myocutaneous flap. The surgical wound was closed layer by layer and the skin was sutured using Prolene 3.0 and skin stapling. For the postoperative treatment, the patient was given 2 x 1 gram intravenous ceftriaxone, Tramadol analgesic 100 mg drip in 500 cc Ringer's lactate.



Figure 1. Surgical incision design. Wide excision (A). Pectoralis major myocutaneous flap design (B)

Pectoralis major myocutaneous flap surgical technique

Vascular pedicle marking on the body surface was obtained by making a straight

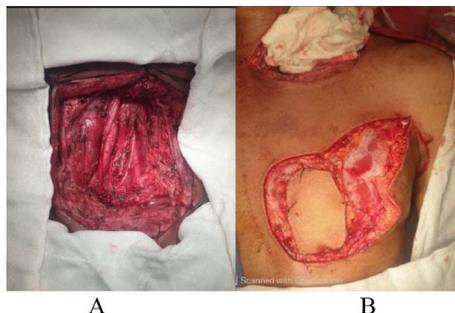


Figure 2. Surgical wound defect (A) Skin Paddle (B)

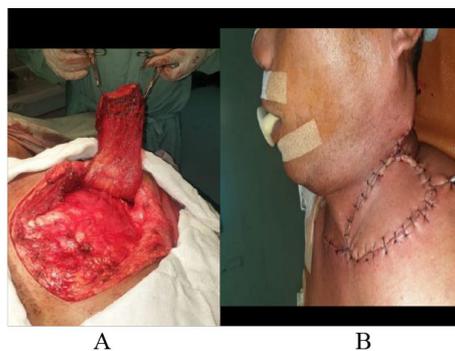


Figure 3. Harvested flap (A) Closed defect (B)



Figure 4. Primary donor site closure (A). Viable flap 3 days post operative (B)

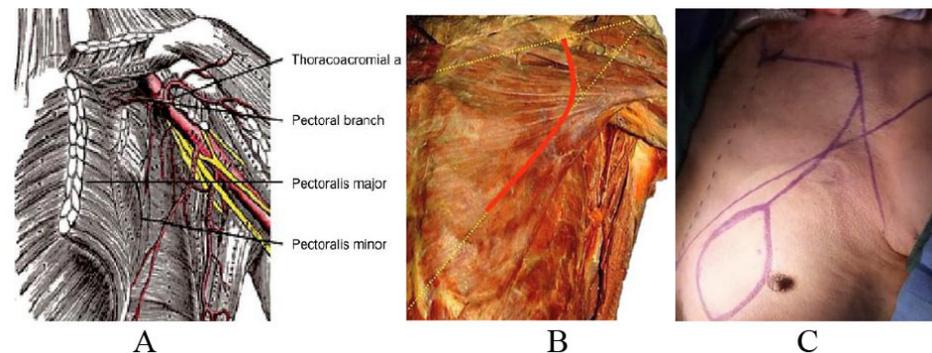


Figure 5. Vascular pedicle (A). Anatomy of musculus pectoralis major (B), and projecting line of vascular pedicle (C)

line from the ipsilateral acromion to the xiphoid process and drawing another perpendicular line starting from the middle of the clavicle and cutting the first line. A skin paddle flap is placed over the surface along the pectoralis major muscle that is supplied from the pectoral branch of the thoracoacromial artery (Figure 5)^{3,5} as it is known that the main blood supply to the pectoralis major muscle is the thoracoacromial artery. There were two other vascular supplies, namely the internal mammary artery with its perforator branches and the lateral thoracic artery.⁶

During flap elevation, caution must be taken so that the skin paddle does not come off. It is better if the skin paddle is sutured with several stitches to minimize the risk of traction trauma to the myocutaneous perforator. The dissection margin between the minor and major muscles and their pedicles will be found by dissecting the lateral border of the pectoralis major. The musculus pectoralis major is dissected from the lateral into the pedicle while keeping the pedicle under observation, freeing it from the humeral bone if necessary. Part of the clavicle tissue is separated leaving only the vascular pedicle and its intervention. The flap can then be passed through the subcutaneous tunnel to the neck over the clavicle. The tunnels are wide enough so that the flaps can easily pass through the tunnel without pressing. The flap was sutured interruptedly with vicryl 3-0. Drain suction was placed on the neck and chest, and the surgical wound is sutured layer by layer. Try to primary closed the donor site with wide undermining.³

DISCUSSION

Reconstruction of surgical wound defects in the head and neck is still a challenge for surgeons. Currently, the free flap is the gold standard for covering defects in the head and neck. However, due to its limited availability, lack of free flap training, large number of patients, and economic reasons, the free flap service is not widely used, especially in developing countries. This has led to the widespread use of regional and pedicle flaps.^{2,7} Thus, PMMF is still being used in many centers with success to cover cervicofacial defects.

Saito et al. reported that the greatest advantage of PMMF is survival. A completely dead free flap may still be found in experienced surgeons. Although PMMF is performed by an inexperienced surgeon, the failure is extremely rare due to the reliable vascularity and short training procedures.² Other advantages of PMMF include adequate size, easy harvesting, minimal donor defects, and suitable for the head and neck area. Skin pads can be used for reconstruction of the oral mucosa, skin, or both. In addition, compared to free flap, this procedure requires a short time and does not require intensive postoperative monitoring.⁸ One of the limitations of PMMF is the possibility of inconsistent circulation of blood that can lead to partial or complete necrosis of the flap. Skin necrosis is a common complication. Some authors reported an incidence of skin necrosis between 7% and 27%. However, if this skin necrosis occurs, the skin graft can be used to cover this skin defect, because the large blood vessels still reach the pectoralis major muscle.⁸

CONCLUSION

The pectoralis major myocutaneous flap is a great modality that used to cover surgical defects in the head and neck area. It has good vascularization and the required operating time is relatively short and the technique is easy.

ETHICAL CONSIDERATION

This study has received ethical approval from the Ethics Commission of Dr. M. Djamil Hospital, Universitas Andalas, Padang before the research was carried out.

CONFLICT OF INTEREST

None to be declared.

FUNDING

The authors received no financial support for the research, authorship, and publication of this article.

AUTHOR CONTRIBUTION

All authors contributed to all processes in this work, including patient selection, operative procedures, post-operative management of patient, and flap monitoring as well as drafting and seeking approval for publication of this manuscript.

REFERENCES

- Ribeiro Salles Vanni CM, De Matos LL, Faro Junior MP, Ledo Kanda J, Cernea CR, Garcia Brando L, et al. Enhanced morbidity of pectoralis major myocutaneous flap used for salvage after previously failed oncolological treatment and unsuccessful reconstructive head and neck surgery. *Sci World J*. 2012;2012.
- Bhanja A, D'Souza DSJ, Roy C, Poddar RN. Reliability of the pectoralis major myocutaneous flap in reconstructive oral cancer surgery in developing countries: Our experience. *Med J Armed Forces India*. 2016;72:S1-7. Available from: <http://dx.doi.org/10.1016/j.mjafi.2016.02.013>
- Tripathi M, Parshad S, Karwasra R, Singh V. Pectoralis major myocutaneous flap in head and neck reconstruction: An experience in 100 consecutive cases. *Natl J Maxillofac Surg*. 2015;6(1):37.
- Patel K, Lyu DJH, Kademani D. Pectoralis major myocutaneous flap. *Oral Maxillofac Surg Clin North Am*. 2014;26(3):421-6. Available from: <http://dx.doi.org/10.1016/j.coms.2014.05.010>
- Fagan J. Open Access Atlas of Otolaryngology, Head & Neck Operative Surgery. *Atlas Otolaryngol, Head Neck Oper Surg*. 2008;(Figure 1):1-12. Available from: www.entdev.uct.ac.za
- M D, G N. Extended pectoralis major myocutaneous flap in head and neck reconstruction. *World J Otorhinolaryngol*. 2013;3(3):108-13.
- Akhtar M, Bariar L, Chaudhary R, Khurram M. Use of pectoralis major myocutaneous flap for resurfacing the soft tissue defects of head and neck. *J Orofac Sci*. 2014;6(2):88.
- J.-W. H, N.-Y. W, Y.-Y. L. Using a pedicle pectoralis major musculocutaneous flap in head and neck reconstruction after modified radical mastectomy. *Med (United States)*. 2017;96(15):2016-8. Available from: <http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L615490239%0Ahttp://dx.doi.org/10.1097/MD.0000000000006313>



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