Folded Pectoralis Major Myocutaneous Flap for Complex Oromandibular Defects: A Case Report with Surgical Technique

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Summary

Oral cancer presenting in late stages requires extensive resection and mandibulectomy. Ideal reconstructive options for such defects are composite-free flaps so as to provide outer skin covering and bridge the mandibular defect. The availability of expertise and resources for such complex reconstructive surgeries is a setback. The predominant alternative in these cases is the use of the workhorse flap, the pectoralis major myocutaneous (PMMC) flap; there are several modifications proposed since the flap was first described. The most common modification, which is used, is bipaddle PMMC which carries an increased risk of complications. Here, we present a modification of PMMC flap for reconstruction of complex defects created after resection of buccal

Introduction

Reconstruction of the oral commissure after fullthickness resection of carcinoma buccal mucosa with skin and mandible involvement poses a challenge. This involves simultaneously reconstructing the cheek skin and buccal mucosa and providing support for mandibular defect. To solve this issue, a number of methods have been documented in the literature (1-3). Method of choice for such defect is composite-free flaps. Nonetheless, the method requires expertise and increased operative time, which is frequently a constraint in countries with limited resources. Various modifications of pectoralis major myocutaneous (PMMC) have been described in the literature. The most common modification used for a complex mucosal, mucosa, mandible, and cheek skin with lesser complications and without the need for free flaps.

Keywords: Pectoralis major, Myocutaneous flap, Oral cancer, Oromandibular defect

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bony, and skin defect is bipaddle PMMC flap. This modification however has more complications in terms of donor site morbidity and skin necrosis (4). Herein we describe a surgical modification of the PMMC flap for such complex defects with lesser complications. This is a modification where in spite of bipaddling, the flap is folded in itself to obtain inner and outer lining with added bulk in between for mandibular defect.

Case report and technical details

A 64-year-old man presented with growth buccal mucosa to a tertiary care center in rural India. The lesion involved the left buccal mucosa, alveolus, oral commissure, and cheek skin. The patient was

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edentulous, and marginal mandibulectomy was not advisable due to the risk of fracture of the remaining mandible.



Figure 1. Computed tomography showing lesion involving the skin.

The patient was staged in accordance with the American Joint Committee on Cancer (AJCC) 8th edition staging as cT4N0Mx, and the biopsy confirmed it to be a moderately differentiated squamous cell carcinoma. The patient underwent a detailed history, clinical examination, radiological studies, and routine preoperative investigations. On computed tomography, a lesion was seen involving the buccal mucosa, lower gingivobuccal sulcus, and cheek skin (Figure 1). Prior informed consent for surgery and publication was obtained.

The operative plan of full-thickness-wide local excision of buccal mucosa, segmental mandibulectomy with comprehensive neck dissection, and PMMC flap was made. The patient had full-thickness-wide local excision of the lesion with a circumferential incision with 1.5 cm margins all around. Lateral lip split incision with a modified Schobinger incision for neck dissection was used. The standard procedures for dissecting the neck were followed. Measurements were taken of the cutaneous and mucosal defect after the primary was removed. Based on the thoracoacromial artery, an ipsilateral PMMC flap was developed, with dimensions that included the inner and outer linings of the postresection defect.



Figure 2. Full-thickness cheek defect involving commissure.

The mucosal defect encountered was 6×5 cm, and the skin defect was 3×3 cm (Figures 2 and 3), and the size of the skin paddle harvested was 8×9 cm. The inner and outer linings of the defect were formed by folding the flap on itself; the edge of the folded flap formed the commissure that was lacking. The inner borders of the folded flap were sewn to the remaining lingual surface of the alveolar mucosa using 2-0 Vicryl sutures. The remaining cheek defect was fastened to the outside fold of the flap in two layers. A triangle-shaped wedge of the outer lining of the flap was deepithelized to match the edges of the resected lips at the superior and inferior borders, which corresponded to the level of the upper and lower lips. The extraoral cover was formed by the distal part of the flap, while the intraoral lining was formed by the proximal portion. The flap was inset into the defect (Figure 4).

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Figure 3. Complex oromandibular defect after segmental mandibulectomy.



Figure 4. Folded PMMC flap inset into the defect.

The donor site was closed primarily. Post-operative period was unremarkable with no flap-related complications. All margins were adequate and free on post-operative histopathological examination. The patient was followed up weekly for the first 2 weeks and monthly thereafter with acceptable oral competence (Figure 5).



Figure 5. One-month follow-up status.

Discussion

PMMC is a popular locoregional flap used for oromandibular defect reconstruction that is simple to utilize and reliable. We have made use of the majority

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of the flap to maintain oral competency, despite the fact that its size may seem counterproductive. Since Ariyan's description of the PMMC flap for head and neck reconstruction (5), numerous investigations have repeatedly demonstrated the flap's reliability. Free tissue transfer is the best technique for reconstructing any form of head and neck surgical defect; however, PMMC is still useful everywhere in the world for primary and salvage repair. It is impossible to overstate the importance of the flap in head and neck units in poor nations with little resources and high turnover rates. Other noteworthy benefits include good vascularity, a quick learning curve, the ability to reconstruct all layers with a single flap, and a lower requirement for specialized equipment (6). The flap prevents microvascular anastomosis and is especially helpful for older patients with necks devoid of vessels (7). Complications including wound dehiscence, donor site morbidity, bulkiness, flap dehiscence, partial necrosis, edge necrosis, and wound infection are among the drawbacks (8-10). No complication was encountered with our technique, and similar results were reported in another case series (11). Because of the size of the flap, care was taken to account for post-operative drooping and the resulting oral incompetence by overcorrecting the commissure, which compensated for the lack of bony support. The bulk of the flap helped to somewhat offset the jaw's deviation after the segmental mandibulectomy. A large study with adequate sample size and longer follow-up is needed to see the long-term outcome.

Conclusion

In head and neck surgery, the PMMC flap and its variants are dependable and economical reconstruction technique in the age of free flaps.

We present our modification of the PMMC flap for complex reconstruction of oral cavity defects, with the goal of minimizing donor site morbidity and maximizing the amount of skin paddle retrieved.

Consent to Participate

Written informed consent was obtained prior to publication of the case report from the patient.

Consent for Publication

Written informed consent for publication of the patient's clinical details and clinical images was obtained from the patient.

Availability of Data and Materials

This is a case report, and all the data pertaining to the case report have been included in this published article.

Authors' Contributions

AKG and AS prepared the manuscript and was involved in patient management, AJ and RP did the editing and was involved in patient management, and AKG was involved in patient management and preparing the final draft for submission.

Ethical Approval

Case reports are exempted for ethical approval from institutional ethics committee.

References

- Henn D, Nissen A, Menon N, et al. Restoration of oral competence in double free flap reconstructions of massive lower facial defects with fascia lata slings - case series and review of the literature. Case Rep Plast Surg Hand Surg. 2015; 2(3–4): 67-72.
- Jeng S-F, Kuo Y-R, Wei F-C, et al. Reconstruction of extensive composite mandibular defects with large lip involvement by using double free flaps and fascia lata grafts for oral sphincters. Plast Reconstr Surg. 2015; 115: 1830-6.
- El-Din AB. Total lower lip and commissure reconstruction using a composite radial forearm palmaris longus free flap. Egypt J Plast Reconstr Surg. 2007; 31(1): 73-8.
- Soni A, Paul S, Jotdar A, et al. A meta-analysis of complication rates among various surgical modifications of pectoralis major myocutaneous flap. Indian J Otolaryngol Head Neck Surg. 2022; 74(Suppl 3): 5841-9.
- 5. Ariyan S. The pectoralis major myocutaneous flap. A versatile flap for reconstruction in the head and neck. Plast Reconstr Surg. 1979; 63(1): 73-81.
- McLean JN, Carlson GW, Losken A. The pectoralis major myocutaneous flap revisited: a reliable technique for head and neck reconstruction. Ann Plast Surg. 2010; 64: 570-3.
- 7. Tripathi M, Parshad S, Karwasra RK, et al. Pectoralis major myocutaneous flap in head and neck reconstruction:

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an experience in 100 consecutive cases. Natl J Maxillofac Surg. 2015; 6(1): 37-41.

- Patel K, Lyu DJ, Kademani D. Pectoralis major myocutaneous flap. Oral Maxillofac Surg Clin North Am. 2014; 26(3): 421-6.
- Metgudmath RB, Metgudmath AR, Metgudmath VV, et al. Versatility of pectoralis major myocutaneous flap in oncosurgery and its role in developing countries. Indian J Otolaryngol Head Neck Surg. 2013; 65(1): 80-4.
- Hoda N, Moza A, Saraf A, et al. Evaluation of flap complications following pectoralis major myocutaneous flap reconstruction for oral cancers. Oral Oncol Rep. 2024; 12: 100655.
- 11. Mitra S, Panda S, Amit Singh C, et al. Folded pectoralis major myocutaneous flap for reconstruction of complex oral commissural defects: a retrospective case series and technical report. Indian J Otolaryngol Head Neck Surg. 2024; 76: 1251-4.