

Crossed pectoralis major myocutaneous flap for recurrent oral cavity cancers

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ABSTRACT

Background: Oral cavity cancers are fairly common and have propensity to recur locally. Since Pectoralis Major Myocutaneous (PMMC) flap is the most widely used first flap for reconstruction, it is exhausted at the earliest and recurrence poses a formidable challenge for reconstructive surgeon. Present study evaluated the feasibility of contralateral Pectoralis Major Myocutaneous Flap for reconstruction after resection of recurrent tumour. **Methods:** This was a study of the patients presenting with recurrent oral cavity cancer after exhausted ipsilateral Pectoralis Major Myocutaneous Flap (PMMC) in whom we used contralateral Pectoralis Major Myocutaneous Flap (Crossed PMMC Flap) for reconstruction between October 2013 to June 2016. **Results:** Five patients with recurrence underwent reconstruction with contralateral Pectoralis Major Myocutaneous Flap. In all the flap was successfully used to reconstruct defects involving the entire buccal mucosa and in one patient the flap could be used to reconstruct full thickness resection defect (crossed bipedal PMMC Flap) with ease. **Conclusion:** Crossed Pectoralis Major Myocutaneous Flap can be used safely and reliably for reconstruction of the buccal mucosal defect and in selected patients even for full thickness cheek defect as folded bipaddle Pectoralis Major Myocutaneous Flap.

Keywords: Contralateral pectoralis major myocutaneous flap, crossed pectoralis major myocutaneous flap, folded crossed pectoralis major myocutaneous flap, pectoralis major myocutaneous flap, recurrent oral cavity cancer

INTRODUCTION

The goal of surgical oncologist is to resect tumor with negative margins and reconstruct the defect giving good functional result and cosmetic appearance. With the passage of time survival and cosmesis has improved due to the introduction of new techniques.^[1] Pectoralis major myocutaneous (PMMC) Flap has remained the mainstay of reconstruction in head and neck cancers^[2] since 1979 when first used by Ariyan.^[3]

The reconstructive ladder starting from skin grafts and ending with free flaps may not always be followed due to anatomical and functional requirements of the defects. Skin graft and local flaps such as nasolabial flap are useful for smaller defects. For larger defects, pedicled or free flaps are required. The pedicled flaps commonly used for oral reconstruction include PMMC flap, forehead flap, latissimus dorsi and platysma myocutaneous

flaps^[4] and skin flaps such as deltopectoral flap and submental artery flap.^[5] Microvascular free flaps^[6] have become the method of choice in a great number of defects. This becomes more significant in reconstructing the composite soft tissue and bony defects. Despite a variety of available options, the PMMC flap never seems to lose its relevance in the reconstructive work in head and neck surgery.

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Patients of oral cavity cancer make the majority of work in our surgical oncology outpatient department and commonly presenting locally advanced stage. PMMC flap is the main tool for reconstruction in our department due to easy availability and reliability. We used PMMC flap in about 125 patients last year for head and neck reconstruction. In 24 cases, bipedal PMMC flap with tram track de-epithelization was used to cover mucosal and skin defect simultaneously. Due to high recurrence rate in oral cavity cancers and since a proportion of which can be salvaged, there is always need of second line option for reconstruction. The traditional options are Latissimus dorsi myocutaneous flap and forehead flap. Latissimus dorsi flap requires a change in the position of the patient and forehead flap is unsightly. The option of contralateral PMMC flap appeared very much viable to us, and we used the same in a number of our patients. As there are little data in the literature regarding reconstruction after salvage surgical treatment or failed reconstruction after ipsilateral PMMC flap is used, our aim was to share our experience of reconstruction of complex oral defects, arising from surgical treatment for cancer, by the use of contralateral PMMC flap (crossed PMMC flap). We report our experience of five crossed PMMC flaps. There was no difference in the magnitude of defect that could be reconstructed compared to ipsilateral PMMC and could close defects as large as 8 cm × 6 cm, in one case it was used as folded PMMC to cover full thickness cheek excision using our technique of folded PMMC with tram track de-epithelization.

We report the reliability and versatility of this flap showing its high effectiveness in meeting our surgical needs.

MATERIALS AND METHODS

This is a study of head and neck cases operated by us. We identified five patients in whom we had used contralateral PMMC flap. Patients' age ranged between 30 and 70 years. All patients who had Eastern Cooperative Oncology Group performance score more than 2, who developed recurrent disease after primary surgery with ipsilateral PMMC flap used for reconstruction and received adjuvant treatment as considered appropriate were included in the study. Patients with distant metastasis or considered unresectable or not willing for surgery were excluded. After proper clinical and radiological evaluation for resectability, salvage surgery for a locoregional recurrence of the cancer were undertaken, and the defect reconstruction was done using contralateral PMMC flap (crossed PMMC flap). The standard surgical technique was used to harvest PMMC flap, those in whom extra length of the flap pedicle was required the muscle was dissected in hockey stick-shaped manner to get some extra length. The flap was transposed to contralateral side through subcutaneous tunnel in three patients in whom contralateral neck dissection was not done and through open neck wound in two patients in whom the neck was addressed [Figures 1-7]. The parameters studied were patients' age, sex, previous surgery, size of recurrence at presentation, size of defect, anatomic boundaries of the defect, surgery time, blood loss, and hospitalization duration and date of suture removal. Patients' were followed up in postoperative period to see the short-term complications in the flap (till discharge or first follow-up). Complications related to the flap were categorized into major and minor complications.

Table 1: Patient variables

Variable	Observation
Median age (years)	52
Male:Female (n)	3:2
Comorbidity	Nil
Previous treatment (composite resection with neck dissection and pectoralis major myocutaneous with adjuvant radiation) (%)	5 (100)
Operative time (average)	210 min
Duration of hospital stay (days)	10-12 (range)
Stage IV A (%)	5 (100)
Area reconstructed (largest)	8 cm × 6 cm
Subsite reconstructed	
Skin and mucosa simultaneously	1
Only oral mucosa	4

Table 2: Observed complications

Complication	Incidence
Major complications	Nil
Minor complications	Minor complications
Seroma formation	1
Partial wound dehiscence	1
Flap loss (total and partial)	Nil

Major complications were those that needed reoperation, or that resulted in failure of the reconstruction objective thereby needing another flap. Minor complications were considered those that were treated in a conservative manner. Conservative treatment comprised dressings, debridement, and the use of medication. Partial or total loss of the flap was analyzed separately.

RESULTS

In this study, the mean age was 52 years; there were three male and two female patients. All patients were stage IVA when initially treated according to AJCC staging 7th Edition. We were able to reconstruct almost entire buccal mucosa and in one patient superiorly defect involving the upper alveolus. The largest size of defect closed was as large as 8 cm × 6 cm [Table 1]. One patient having recurrence involving previous PMMC flap and the overlying skin a folded crossed PMMC flap with tram track de-epithelization was used to cover full thickness defect. In remaining four patients, PMMC flap was used for mucosal defect only. In postoperative period, no patients had any major complications, one patient had seroma formation beneath the flap and one, in whom folded PMMC was used, had suture dehiscence which was managed conservatively Table 2 and all 5 patients were discharged within 10–12 days. The mean operation time was 3½ h.

DISCUSSION

The principle for surgical treatment of head and neck cancer include adequate resection margin with functionally and esthetically good reconstruction however in the fright of reconstruction; margins should not be compromised.^[1] Most of the head and neck surgeons would use PMMC or latissimus dorsi myocutaneous flap.^[7] However, recently microvascular free flaps are considered the gold standard method for reconstruction of major defects following head and neck cancer surgery.^[8] In the era of microsurgical free flaps, pedicled flaps still hold their



Figure 1: Recurrence post pectoralis major myocutaneous preop



Figure 2: Tumour being resected

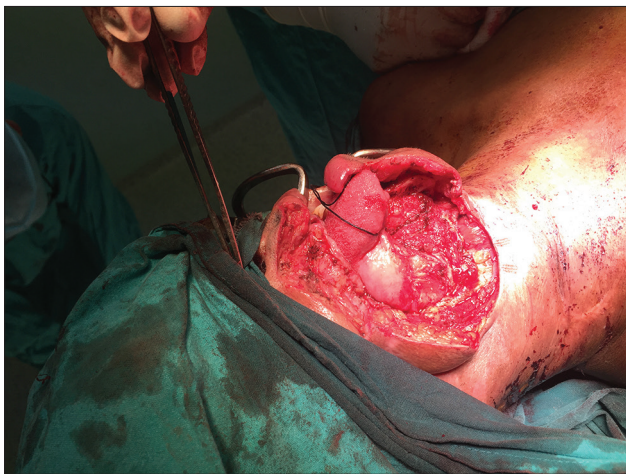


Figure 3: Post resection defect



Figure 4: Pectoralis major myocutaneous being tunnelled

position for the reconstruction of oral cavity cancers,^[9] especially we have found great advantage of using PMMC flap as it is easy, done early and adds to the bulk of reconstructed tissue thereby maintaining the contour especially in full thickness cheek defects posthemimandibulectomy or maxillectomy where a radial forearm flap will leave a distinct hollow due to lack of bulk.

In our study of five patients with three males and two female with mean age of 52 years, all patients were stage IVA according to AJCC 7th Edition at initial presentation who had a recurrence of oral cavity cancer after definitive treatment. In all these patients, ipsilateral PMMC flap was used in previous surgery. The selection of crossed PMMC flap was considered as it is easy to harvest and it is reliable attested to by the reduced number of losses, low rate of complications, and high rate of success. The literature shows that the PMMC flap produces good results,^[10,11] although complications had been seen^[12,13] and especially in patients who had received previous treatment.^[14,15] In four patients, crossed PMMC flap was used to cover mucosal defect in the oral cavity and in 1 patient folded contralateral PMMC flap was used to cover mucosal and skin defect simultaneously. Chiummariello *et al.* used PMMC flap and studied the complications of salvage reconstructions for the oral cavity, oropharynx, skin, and hypopharynx due to squamous cell carcinoma in 12 patients over a period of 17 months.^[16]

Relatively, small numbers of patients in the present study possibly reflect a general reluctance toward this flap for second-line reconstruction where generally deltopectoral, latissimus dorsi, forehead or a free flap is preferred. There is paucity of literature on this flap and this study may contribute significantly toward increasing the general acceptance of this flap. The versatility of this flap is quite evident from our results that this flap can also be used with suitable modification to reconstruct full thickness defects simultaneously as previously described. The success rate is high with few complications as only two patients had minor complications namely seroma formation and partial suture dehiscence. The results should also be viewed in light of previous adjuvant treatment at least theoretically, as McLean *et al.* described more complications in previously irradiated patients.^[17] Our results are also supported by the study of Kruse *et al.*^[12] on 20 cases of PMMC over 11 years, of which seven were salvage surgeries and found comparable complications.

Our experience with crossed PMMC flap is small but is comparable with the clinical study by Ribeiro Salles Vann *et al.*^[18] We further propose absence of prolongation of treatment as an advantage in contrast to deltopectoral fasciocutaneous or forehead fasciocutaneous flap which requires second stage detachment and resuturing after about 3 weeks and final suture removal about 10 days after this effectively delaying adjuvant treatment.



Figure 5: Tunnelled contralateral pectoralis major myocutaneous



Figure 6: Intraoperative picture post Flap reconstruction



Figure 7: After Suture removal

CONCLUSION

In the modern era of microsurgical techniques, free flaps are the reconstructive option of choice. However, the PMMC flap is still an acceptable alternative as it is economical, has reliable vascular supply, can be done without any special instruments. The versatility of PMMC flap has further been demonstrated in our study to be sufficient to reach to contralateral resting

motor threshold area and to reconstruct both mucosal and skin defect (crossed folded PMMC flap) with significant advantage compared to traditional fasciocutaneous flaps. Hence, we propose it as a suitable alternative after exhausted ipsilateral PMMC flap in recurrent oral cavity cancers.

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Conflicts of interest

There are no conflicts of interest.

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