

Pectoralis Major Flap: Clinical application in reconstruction of oral defects after oncological resection

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Abstract:

The use of PM pedicle flap in the closure of intraoral or through and through defects after surgical excisions of oral pathologies has gained popularity, probably due to its versatility. The aim of this study is to evaluate the clinical application of PM flap in various oral defects and objective is to evaluate the outcome of PM flap for medium to larger defect reconstruction.

In this study 40 patients with 28 male and 12 female were included with advanced oral malignancy that developed postsurgical large intra oral defect or through and through oral defect. On analysis of outcome 2 patients had complete flap necrosis. Minor complication like partial flap necrosis, wound dehiscence/infection and fistula formation founded in 8 cases. All the patients had acceptable cosmetic and functional outcome except excessive bulk in 3 patient and neck contracture in 2. Satisfactory mouth opening and reasonably good quality of speech and deglutition were observed in all patients.

PM remains an excellent reconstructive option for large oral defect in spite of increased use of micro vascular flap in a limited facility center.

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Introduction:

Reconstruction of post excision defects of oral cavity malignancies is still a challenge to reconstructive surgeons. These complex defects often have extensive loss of mucosa, bone, soft tissue and skin. Ideal reconstruction should replace all these structures to achieve acceptable aesthetic and functional results¹. Primary reconstruction of such defects with microsurgical techniques is now the protocol in all standard cancer centers². But in view of the long operative time, the need

for expertise and infrastructure and the large work volume in developing countries, microsurgical reconstruction cannot be offered to all patients with such defects.

Reconstruction with PM flap gives a better outcome with a minimum complication rate. Its versatility provides wider clinical application in oral defect reconstruction. As the donor site morbidity is minimum with a low complication rate the choice of PM flap for oral reconstruction is gaining popularity among the surgeons from low socio-economic country.

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The PM flap has played an important role in head and neck reconstructive surgery since its introduction by Ariyan in 1979³. The advantages of this pedicle flap include proximity to the head and neck, the relative ease with which it is harvested, and its overall reliability in terms of flap survival and plays important role in patients those for whom a free flap is not indicated but are in need of a salvage operation because of a failure of a previous free flap, those with local problems such as fistula, and those who are in need of the coverage of the exposed vessels for prevention and treatment purposes. The main disadvantage associated with the use of the PM flap for reconstruction of oral cavity is the thickness of the flap, which is determined by the amount of subcutaneous fat between the pectoralis muscle and the overlying skin paddle⁴.

The current study was conducted to assess the versatility and the reliability in clinical application of PM flap in head and neck reconstruction. Also the final functional and aesthetic result was evaluated.

Patients and methods:

This study was carried out between June 2011 and December 2014 on 40 patients of oral cavity malignancy at the Department of Oral & Maxillofacial Surgery, Dhaka Dental College Hospital and Dhaka. In all cases histopathological examination were performed to confirm the diagnosis. All the patients were stage IV based on clinical and radiological (CT or MRI) examination. Reconstruction with PM flap was done in patients who developed through and through defects after oncological resection. Patients with distant metastasis and medically compromised (uncontrolled DM, cardiac problems, immuno compromised, immuno suppressed, etc.) were excluded from this study. Preoperative assessment included routine complete blood count, bleeding and coagulation profile, kidney functions, ECG. An echo cardiography was done for patients presented with a past history of cardiac problems and in over 50 years of age at the time of surgery. The flap design to fit the defect was planned preoperatively. The Consent form with the explanation of the extent of surgery, reconstruction technique and donor site defect and the potential complications were discussed and signed by the patient.

The flap was designed depending on the site, size and shape of the defects. The skin island was usually below and between the nipple and sternum. In case of female flap was designed from sub mammary region. The flap was elevated from a distal to a proximal direction. The pedicle of the flap (the acromiothorathic artery and the lateral thoracic artery) was identified and preserved. During the flap elevation the pectoral fascia and the muscle were secured to the skin to protect the perforators. The flap was elevated up as far as the clavicle where the pedicle was made narrow. The lateral pectoral vessels left intact or divided depending on the flap volume and tension. In all cases the donor site were closed primarily.

The postoperative complications and the total hospital stay were all documented. Follow-up of patients involved clinical examination and radiological investigation for the assessment of local/nodal recurrence and /or distant metastasis. The final aesthetic and functional (Swallowing, deglutition, speech) results were also evaluated in follow up.

Result:

Out of 40 patients 28 male and 12 female patients were included and 5 patients had Fungative skin lesion, 18 had alveolus and cheek involving the skin, 14 patients had Retromolar area with floor of the mouth and 3 had lesions at the Alveolus with involvement of skin over chin.

Of the 40 patients included in this study, all achieved satisfactory cover except 2 patients who had complete

flap necrosis and 2 had partial flap necrosis with fistula formation. One patient was later reconstructed with latissimus dorsi flap and other was by free antero lateral thigh flap. Two patients with partial flap necrosis recovered with regular dressing.

Four patients had wound complication like dehiscence and infection were managed by regular dressing and appropriate antibiotic application.

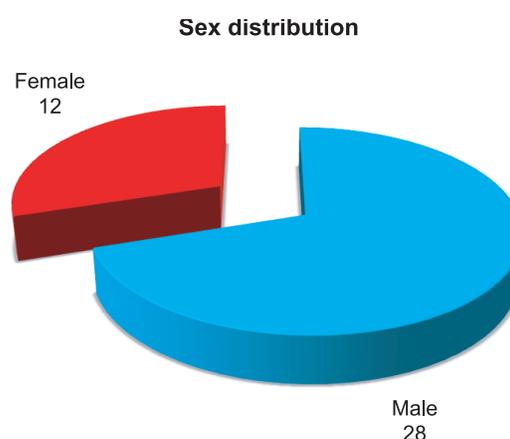


Fig.-1: Pie chart of sex distribution.

Table-I

Site of the primary lesion.

Site	No. of patients
Fungative skin lesion	05
alveolus and cheek involving the skin	18
Retromolar area with floor of the mouth	14
Alveolus with involvement of skin over chin	03

Table-II

Outcome (Complication)

Complication	No. of patients	
Flap Necrosis	Complete	02
	Partial	02
Wound dehiscence	03	
Wound infection	01	
Fistula	02	

Secondary closure was done after wound (fistula) debridement in case of fistula (of two patients) formation.

Table-III

Outcome (Aesthetics)

Aesthetical factors	No. of patients
Excessive Bulk	03
Neck contracture	02

From the aesthetic point of view all had satisfactory result but three had excessive bulk while other two developed neck contracture.

All the patients had satisfactory mouth opening ranges from 22 mm to 30 mm. with no major complaints of difficulty in swallowing and speech was found in the follow up.

Table-IV
Outcome (Function)

Function	Quality
Mouth Opening	adequate (>22 mm)
Speech	good
Swallowing	good

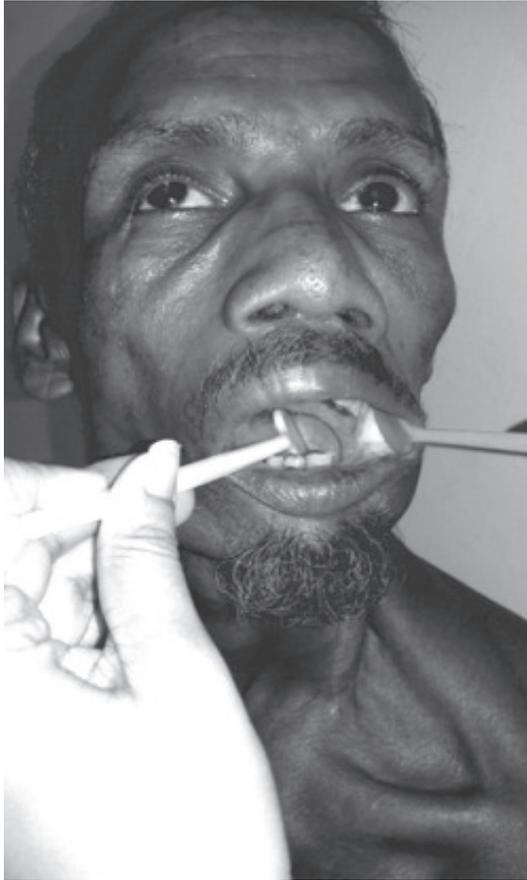


Fig.-1.1: Mouth opening 2 years after surgery.



Fig.-1.2: Appearance 2 years after surgery.



Fig.-2.1: Presenting with skin involving Oral SCC.



Fig.-2.2: Immediate post-operative.



Fig.-2.3: Ten days after surgery.



Fig.-3.1: Eighteen month after surgery.



Fig.-3.2: Mouth opening eighteen month after surgery.

Discussion:

After Ariyan's⁵ description in 1979, the pectoralis major myocutaneous flap has been the workhorse for head and neck reconstruction. Easy reach of the flap, reliable vascularity, technical simplicity, coverage of the exposed vessels by muscle after neck dissection and the ability to provide bulk made it a popular option amongst oncoreconstructive surgeons. Although the introduction of micro vascular flap have superseded the utilization of the PM flap in the reconstruction of oral defects by virtue of its pliability and less bulk. One stage reconstruction, no need to change the patient's position, and the large cutaneous island are most favorable reasons to select the PM flap for head neck reconstruction.

Total flap necrosis observed in 2 patients (5%) while Shah et al. (1990)⁶ and Kroll et al. (1990)⁷ showed total flap necrosis occurred extremely seldom.

In our study partial flap necrosis found 5% (2 in number), in the published reports by shah et al. (1990)⁶ who reported 29% of partial flap necrosis and Mehta et al. (1996)⁸ with 25% of partial flap necrosis.

Other minor complications like wound dehiscence, wound infections were found in 4 patients (10%) and all of them recovered by local wound care. In case of fistula formation

of 2 cases (5%) local debridement and secondary closure solved the issue.

Functional result was good and aesthetically later we found good color and texture matching and thread like scar mark over the face.

Although reduced mouth opening found ranging from 22 mm to 30 mm, but it is adequate for daily dietary intake. The speech was found to be hampered little in comparison to preoperative stage.

Incidence of donor region complication was 5 % (2 patients) in this series. As the donor sites were always closed primarily may lower the incidence of donor site complications than in previously published data. Biller et al. (1981)⁹ reported 7%, Baek et al. (1982)¹⁰ 5% and Ossoff et al. (1983)¹¹ 8% of donor site complications.

Like other flap it has few disadvantages. Neck recurrences may remain hidden initially under flap which makes delay in detection of early recurrence. Violation of breast symmetry and often inclusion of breast tissue in the flap occurs in female.

Conclusion:

Despite the increased use of free flaps, PM flap still remains as an excellent choice for oral reconstruction especially in the centers of limited facilities. Large number of patients

could be useful in assessment of the final functional and the aesthetic outcome of the PM flap as compared to the free flaps.

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