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PECTORALIS MAJOR MYOCUTANEOUS FLAP FOR RECONSTRUCTION OF FACIAL CONTOUR DEFECT FOLLOWING TOTAL PAROTIDECTOMY – AN INSTITUTIONAL STUDY

Oncology

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ABSTRACT

Parotidectomy creates both aesthetic and functional issues creating a unique challenge for reconstruction to each surgeon. In this era of free flaps, pectoralis major myocutaneous flap still remains a versatile flap among head and neck cancer patients. A retrospective study was conducted at a tertiary hospital to evaluate the results of postparotidectomy defect reconstruction with PMMC flap. This study outlines our experience in reconstruction of postparotidectomy defects with PMMC at our institute.

KEYWORDS

Parotidectomy, Pectoralis Major Myocutaneous Flap (pmmc).

1. INTRODUCTION

Salivary gland neoplasm constitutes a diverse variety of benign and malignant tumors. It constitutes 2 to 6% of head and neck tumors.The distribution of tumors shows 80% parotid origin and 10% each in submandibular glands and minor salivary glands. Among malignant tumors , 70% arises in parotid gland,10-25% arises from minor salivary glands. Remaining are submandibular carcinomas and sublingual carcinomas which are rare. According to 2017 WHO classification of salivary gland tumors, there are 22 malignant and 13 benign tumors[1]. Surgery is the main stay of treatment in parotid neoplasms. Total parotidectomy includes removal of the superficial and deep parotid gland. Following situations are the indications[2]

1. Metastasis to a superficial parotid node from a primary tumor or an extraparotid malignancy
2. Any parotid malignancy that indicates metastasis by involvement of cervical lymph nodes
3. Any high grade parotid malignancy with a high risk of metastasis

The surgery may involve sparing or sacrifice of facial nerve branches or trunk depending on the tumor extent to the nerve. When the tumors extend beyond the confines of salivary gland (involving skin, soft tissue, mandible and or facial nerve) reconstruction is needed to restore the structure and function of the composite defect. Proper analysis of the defect and its functional consequences will guide in the most appropriate reconstructive technique.

Acellular dermis, autologus fat graft and superficial muscular aponeurotic system flap are the options for smaller defects[3,4]. The flaps for larger volume loss or skin defects include the sternocleidomastoid flap, supraclavicular artery island flap and submandibular gland flap[5]. The use of cervicofacial and cervicodeltopectoral flap is the simplest and the most aesthetically pleasing options for cutaneous defects after radical resections. In situations where deeper or composite defects occur, a second mucosal lining or soft tissue volume will be required. Pectoralis major is the most popular option in this situation. The pectoralis major myocutaneous flap is considered as the work horse for head and neck reconstruction owing to its good vascularity and easy learning curve. Its major advantages are as follows:

1. It is easy to harvest.
2. It provides one or two skin paddles for skin or intraoral resurfacing.
3. It provides ample soft tissue coverage.
4. It is the salvage flap for failed, unsuccessful or unfeasible free flaps.
5. It can be used in conjunction with a free flap for composite or large defects.

In this study, we retrospectively analyzed the outcome of PMMC flap used for reconstruction of facial contour defect following total parotidectomy, done between 2016 to 2018 (3 years) in our institution.

2. MATERIALS AND METHODS

A retrospective study was conducted on 22 cases who underwent total parotidectomy with pectoralis major myocutaneous flap reconstruction during the time period of 3 years between 2016 to 2018 in the department of head and neck surgery. Inclusion criteria included both malignant and benign tumors requiring parotidectomy with or without postoperative adjuvant treatment. The data regarding clinical presentations, staging, fine needle aspiration cytology, CECT findings, & final histopathology findings were analyzed. Postoperative and intraoperative findings including intraoperative blood loss, extent of resection, re-explorations done if any, postoperative status of flap and flap failures (partial or complete) were also evaluated.

2.1 OBJECTIVE OF THE STUDY

To discuss the results of post parotidectomy defect reconstruction with PMMC flap in terms of histopathology of tumor, extent of resection, re-explorations required, postoperative status of flap and flap failure rates.

2.2 METHODOLOGY

The plan for initial incision was based on the extent of involvement of the lesion and the need for unilateral or bilateral neck dissection. Ipsilateral PMMC flap reconstruction was done in all cases and the technique was the same for all the cases.

The surface marking for vascular pedicle was made by drawing a line from the ipsilateral acromion to xiphisternum and another line vertically from the midpoint of clavicle to meet the first line. The length of pedicle was designed by measuring distance from the inferior edge of clavicle to the top of the skin paddle which equals or exceeds the distance between superior edge of the defect and the inferior border of clavicle. Skin paddle was designed and sutured to the underlying pectoralis muscle with 3-0 vicryl to minimize the shearing injury to perforators. The dissection plane between the pectoralis minor and major muscles with its vascular pedicle based on the pectoral branch of acromiothoracic artery was delineated. The flap was now passed through a subcutaneous tunnel created superficial to the clavicle. Flap suturing was done with interrupted 3-0 vicryl sutures. Suction drains were placed in the neck and chest and the wound was closed in layers. The donor site was closed primarily.

Figure: 1 designing of PMMC flap

3. Results

A total of 22 cases were reviewed. Of these 12 were females and 10 were males. Their age ranged from 3rd to 7th decade. The most common histological type was pleomorphic adenoma, mucoepidermoid carcinoma, acinic cell carcinoma, squamous cell carcinoma, salivary

duct carcinoma and Melanoma. The histology of these tumors of these are represented in table 1.

Table: 1

Histological type	No of cases
Pleomorphic adenoma	8
Mucoepidermoid carcinoma	5
Squamous cell carcinoma	4
Acinic cell carcinoma	3
Salivary duct carcinoma	1
melanoma	1

All the patients presented with swelling in the parotid region, two with fungating mass. One patient had melanoma of upper eye lid with metastasis to parotid gland and underwent wide excision with parotidectomy. Three cases had involvement of external auditory canal of the same side and underwent sleeve resection of external auditory canal along with total parotidectomy. Total parotidectomy was done in all cases with or without neck dissection. Neck dissection was done for high grade tumors and for clinically or radiologically evident lymphadenopathy. PMMC flap reconstruction was done as primary procedure in all cases except in one case, were it was done as salvage surgery following failure of free flap. Average duration of surgery was 3hrs. 60% patients required intraoperative blood transfusion. For 3 patients, external carotid artery was identified and ligated to control bleeding. Majority of patients underwent lateral tarsorrhaphy as a part of facial nerve rehabilitation.

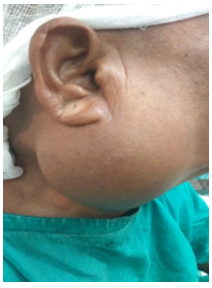

Figure 2: Right parotid swelling

POSTOPERATIVE COMPLICATIONS:

Flap necrosis was divided into partial or complete flap loss. Complete flap loss involved full thickness loss requiring surgical intervention. Partial flap loss involved partial thickness loss and the surgical management, if required, were debridement and secondary suturing. Complete flap necrosis was found in one patient and partial loss in 4 patients. Partial loss was found in all the 4 female patients who required debridement and secondary suturing. Among the 4, one patient required skin grafting to cover the granulations.

Other complications included wound dehiscence (27.2%), haematoma (13.6%), infection(22%) and parotid fistula (4%).

Figure 3: PMMC going to major flap necrosis.

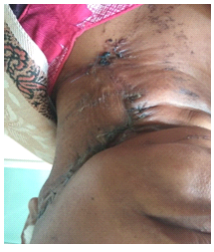

Figure4: PMMC flap following resuturing.

Majority of the patients received postoperative radiotherapy but no major complications following post radiotherapy was reported. Recurrence was reported in one case (salivary duct carcinoma) and the patient expired after 3 months of follow up.

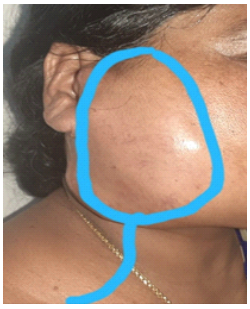

Figure5: Showing malignant parotid tumor involving both deep and superficial lobe.

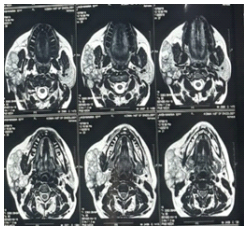

Figure 6: Preoperative imaging

Figure 7: Postoperative picture following radical parodiectomy with modified radical neck dissection and PMMC flap reconstruction

4. DISCUSSION

Parotidectomy results in significant facial contour defects, especially after total or radical parotidectomies. Most of the cases require bulk replacement and skin coverage. There are many options available for reconstruction which includes both local pedicled flaps and free flaps. In the present age of free flaps, lateral forearm flap, anterolateral thigh flap etc. is being considered as ideal for parotidectomy defects. Even with the advent of free flaps, PMMC flaps still remain the workhouse in head and neck defects reconstruction. In our study, we describe our experience with PMMC flap in parotidectomy defect reconstruction.

We had 22 cases in a period of 3 years, which included both benign and malignant tumors. Majority of our cases were recurrent pleomorphic adenoma, followed by mucoepidermoid carcinoma. In our series one early recurrence and death occurred in an aggressive type of salivary duct carcinoma. A hisopathology study by Sando A et al[6] and Bobati S S et al[7] showed pleomorphic adenoma and adenoid cystic carcinoma as the most common benign and malignant tumors respectively. Male to female ratio was almost equal with a slight female predominance which is similar to other studies like Bobati S S et al. All malignant cases were in T3/T4a stage with or without involvement of neck nodes. In our study, PMMC flap reconstruction was done as a primary procedure in almost all the patients except one. Re-exploration was done in 4 patients, 3 of whom were females, where the flap itself was bulky to cover the defects. 4.5% patients in our study developed flap related complications including 1 complete loss and 4 partial loss of flap.

The use of electrocautery near the pedicle region, preservation of clavi

cular attachment of pectoralis muscle creating pressure near the pedicle region following tight closure were considered as factors for flap necrosis. Another factor which is considered to be significant is encompassing maximum perforators in the skin paddle that is designed.

In a study by Tripathi et al, 16% patients developed flap necrosis, of these 6% were major and 10% were minor flap loss[8]. In their series, 40% of flap necrosis cases occurred in patients where the skin paddle extended beyond the 7th rib, where the vascular supply comes from superior epigastric artery, which is a random blood supply. Another reason described by Cunha Gomes et al is the division of lateral pectoral nerve which lies parallel or oblique to PMMC pedicle[9]. In cases where the nerve lies oblique to the pedicle, the pedicle gets compressed after the flap is rotated, which was observed in 30% of their cases. In 2006, Hamdy et al did a study on 26 PMMC reconstructions, showing complications in about 60% cases[10]. Higher complication rates were associated with utilization of flap as a salvage procedure. In our study complication rates were seen in patients with high grade aggressive tumours.

CONCLUSION

The result of our study shows that PMMC still remains the workhorse in head and neck reconstruction even in this era of free flaps. The versatility and reliability of blood supply makes it inevitable in reconstruction options. In our study of parotidectomy defects, PMMC flap was found to be among the best options, especially to cover the bulk loss and to maintain contour of the face with less chances of complications rate comparable to other similar studies.

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