PECTORALIS MAJOR MYOCUTAJNEUUS FLAP FOR RECONSTRUCTION OF DEFECTS FOLLOWING RESECTIONS IN HEAD AND NECK AREA

Pages with reference to book, From 72 To 76

Mohammad Arshad Cheema (Department of Surgery, King Saud University, College of Medicine, Abha, Saudi Arabia.)

ABSTRACT

Pectoralis major myocutaneous flap (PMMF) has become the standard for reconstruction of major defects in head and neck area, Eleven cases, operated over a three year period, in which PMMF was used for reconstruction have been reviewed retrospectively. Nine patients had oral squamous cell carcinoma, one had a basal cell carcinoma of the external ear and one had lost skin and soft tissue of neck following synergistic gangrene. Ten of the eleven flaps survived (success rate 91%). One of the three rib grafts used to reconstruct mandible got infected and had to be removed. Three patients developed wound infections and one had a temporary orocutaneous fistula which closed spontaneously. This brief experience confirms the reliability and efficiency of PMMF for head and neck reconstruction (JMPA 43: 73, 1993).

INTRODUCTION

Resection of advanced cancer in head and neck area is likely to lead to complex defects which usually require skin for covering and/or lining and may require bone for mandibular reconstruction. Previously main options available for this purpose have been axial pattern forehead or delto pectoral skin flaps. Recognition of the fact, that a piece of skin can survive from the blood supply via musculocutaneous arteries from the underlying muscle, has revolutionized the practice of reconstruction in head and neck area. PMMF has become the standard for reconstruction since 1979 reports by Ariyan[1,2]. This paper reports an initial experience with this flap from a hospital in Southwestern Saudi Arabia.

PATIENTS AND METHODS

All cases of head and neck disease in which PMMF was used for reconstruction, operated over a three year period from September 1989 to October 1992, were reviewed retrospectively. Data was collected regarding the site, stage and type of tumour, type of surgical excision and reconstruction. In addition note was made of flap related postoperative complications.

Technique of PMMF

The flap is elevated, based on thoracoacromial artery (TAA), to pectoralis major muscle. The upper chest is prepared and draped with the head and neck area. The flap is marked on the chest skin near the origin of pectoralis major from the 6th rib, according to the size of the defect created after excision of the primary tumour. TAA exits from the clavipectoral fascia to travel on the undersurface of the pectoralis major muscle from the midpoint of clavicle downwards and laterally initially to meet a line drawn from shoulder tip to the xiphoid process (Figure 1c).

Figure 1 (a). Basal cell carcinoma of pinna.

Figure 1 (b). Basal cell carcinoma of pinna .

Figure 1 (c). Basal cell carcinoma of pinna has been excised and PMMF used to cover the defect .

Traditionally it is described to follow this acromioxiphoid line. In actual practice, it is usually noted during flap elevation to deviate 2-3 cm lateral to this line. This observation has also been confirmed by anatomical studies on cadavers by Friedrich et al[3]. A cut is made on the lateral side of marked skin flap down to pectoralis major muscle. Fibers of pectoralis major are separated and the muscle is lifted up to identify the TAA running on the under surface. Transillumination of muscle by dipping a small theater light near the shoulder of the patient with the surgeon moving to the opposite side of the table helps considerably in recognition of this artery. The skin paddle is cut on all sides and its edge is locked by suturing to the underlying muscle to prevent shearing of musculocutaneous vessels. A portion of the 6th rib can be taken with the muscle if it is required for jaw reconstruction. The central portion of pectoralis major muscle is cut up to the clavicle as a narrow pedicle around TAA. The skin incision is extended upwards to the clavicle to assist in this dissection. Once mobilized, PMMF is passed via a subcutaneous tunnel to reach the defect in the head and neck area. If both lining and covering are required for oral cavity, two skin paddles can be fashioned in series on the same muscle as was done with the case in Figure 2.

Figure 2 (a). Carcinoma of buccal mucosa invading cheek skin.

Figure 2 (b). Carcinoma of buccal mucosa invading cheek skin was excised and two skin paddles in series based on pectoralis major muscle have been used.

Figure 2 (c) . Carcinoma of buccal mucosa invading cheek skin was excised and two skin paddles in series based on pectoralis major muscle have been used to reconstruct the lining and covering of cheek. Flap is shown 2 weeks postoperative.

Donor area can be closed primarily over a suction drain, in majority of the patients after wide undermining of edges.

Figure 3 (a). A patient with recurrent tongue cancer and malignant orocutaneous fistula.

Figure 3 (b). A patient with recurrent tongue cancer and malignant orocutaneous fistula had radical neck dissection and hemimandibulectomy and the defect.

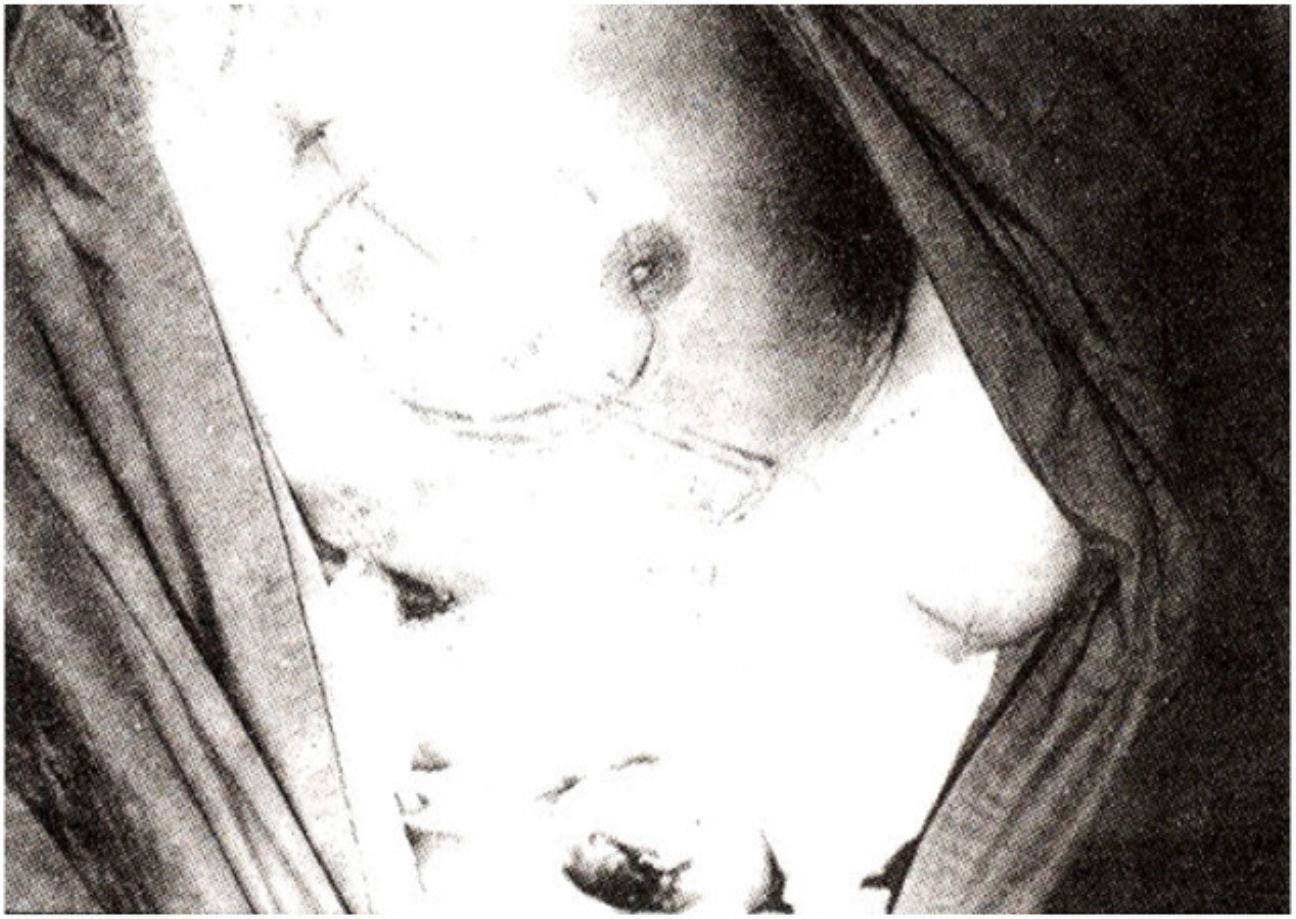

Figure 3 (c). A patient with recurrent tongue cancer and malignant orocutaneous fistula had radical neck dissection and hemimandibulectomy and the defect was reconstructed by using PMMF.

RESULTS

PMMF was used in 11 patients during the study period. There were 7 males and 4 females with median age of 60 years (range 54-90). The disease site, stage and resection type are shown in Table I.

TABLE I. Disease data for 11 patients.

Age	Sex	Site of tumour	Stage	Resection type
75	male	Tongue	T4NOMO	Composite resection including tongue mandible and neck dissection
60	male	"	T4N1MO	"
90	female	Cheek	T4N1MO	Excision of cheek, superficial parotidectomy and mandible + neck dissection
60	female	"	T3N1MO	"
58	male	"	T3NOMO	"
62	male	"	T2NOMO	Excision of cheek + sup. paroridectomy block dissection of neck
57	male	"	T2NOMO	"
64	female	Floor of mouth	T4N2MO	Composite resection
54	male	"	T2NOMO	"
60	female	External ear	T4NOMO	Excision of pinna and superficial parotidectomy
60	male	Synergistic gangrene neck	----	Excision of dead skin and soft tissue

All 9 oral cancers were squamous cell carcinomas and the malignancy on pinna was a basal cell carcinoma. The patient with synergistic gangrene was an uncontrolled diabetic.

TABLE II. Type of flap used and complications.

Flap	Number	Complications
Myocutaneous	8	1 flat loss
Osteomyocutaneous	3	1 rib loss, flap survived
Total	11	1 flap loss + 1 rib loss

Table II shows the type of flap used and associated complications. One flap loss occurred from . a gross error in surgical technique which resulted in damage to the pedicle of this muscle (success rate 91%). One of the three rib grafts used to reconstruct mandible got infected and had to be removed (success rate 66%). Ten patients had donor area closed primarily and one required a split thickness skin graft (Figure 3d).

Figure 3 (d). A patient with recurrent tongue cancer and malignant orocutaneous fistula had radical neck dissection and hemimandibulectomy and the defect was reconstructed by using PMMF from the chest. The flap and the skin graft covering donor area is shown.

No problems were encountered from donor area healing. Three patients developed minor wound infections and one had a temporary orocutaneous fistula which closed spontaneously. There was one hospital death on 22nd postoperative day from myocardial infarction, of a 90 year old lady with diabetes and ischemic heart disease. During a median follow-up of 12 months (range 2-18 months) no

problems have been encountered with any of flaps.

DISCUSSION

This brief experience confirms the reliability of PMMF for head and neck reconstruction as reported in literature[4-11]. The only flap loss occurred from a surgical misadventure. Experience with use of rib graft has not been that favourable. This is in conformity with other reports. Baek et al[4] reported 2 losses in 5 patients which had ostemyocutaneous flaps and Ariyan[11] also had 2 losses from his 5 cases when rib was used. An additional advantage of PMMF is the muscle cover provided by the pedicle to the bare carotid vessels following neck dissection, thus greatly diminishing incidence of carotid blow out. Whole procedure can be accomplished in a single stage. The donor area can be closed primarily in majority of cases with very insignificant cosmetic or functional deficit. Previously major ablative procedures in head and neck requiring lengthy and multi stage procedures which also suffered from cosmetic problems with donor areas. PMMP represents a transformation of that unhappy situation. It has sound anatomical basis and the technique is not difficult to learn. The use of this flap is strongly recommended for moderate sized defects of oral cavity, lower face and neck.

REFERENCES

1. Ariyan, 5.The pectoralia majormyocutaneousflap.Theversatileflap forreconstruction in head and neck.. Plast. Reconstr. Surg., 1979;63:73-81.
2. Ariyan, 5. Further experiences with the pectoralia major myocutaneoua flap for the immediate repair of defects from excisions of bead and neck cancers. Plaat. Reconstr. Surg., 1979;64:605-12.
3. Friedrich, W., Lierse, W. and Herberhold, C. Myocutaneous vascular territoty of the thoracoacromial artery. A topographical and morphometric study of the arterial vascularization of the pectoralis major myocutaneoua flap. Ada. AnaL (Basel), 1988; 131:284-91.
4, Back, SM., Lawson, W. and Biller, H.P. An analysis of 133 pectoralis major myocutaneous flaps. Plast. Reconstr. Surg., 1982;69:460-9.
5. Wilson, J.S.P., Yiscoumettis, AM. and O\'Neil., T. Some observations on 112 pectorals major myocutaneous flaps. Am.J. Surg., 1984;147:273-9.
6. Brusati, R., Collini, M., Bozzetti, A, Chiapasco, M. and Galioto, 5. The pectoralis major myocutaneous flap. Experience in 100 consecutive cases. 3. Crsniomaxillofac. Surg., 1988:16:35-9.
7. Robertson, M.S. and Allison, R.S. The pectoralis major muscle in head and neck reconstruction, Aust.N.Z.J. Surg.. 1986:56:753-7.
8. Josepls, C.A., Gregor, R.T., Davidge-Pitts. N.J. and Waner, M. The versatility of the pectoralia major myocutaneoua flap. Head Neck Surg., 1985;7:365-8.
9. Ossoff, R.H., Wurster, CF., Berktold, RE., Krespi, Y.P. and Siason, G.A. Complications after pectoralis majormyocutaneous flap reconstruction of head and neck defects. Arch. Otolatyngol., 1983;109:812-4.
10. Mehrhof, A.l. Jr., Rosenstock, A., Neifeld, J.P., Merritt, W.H., Theogaraj, S.D. and Cohen, L.K. The pectoralis major myocutaneous flap in bead and neck reconstruction. Analysia of complications. Am.J.Surg., 1983;146:478-82.
11. Ariyan, S. Reconstruction of the oropharyngeal area, in cancer of the head and neck. Edited byS. Ariyan, St. Louis and c.v. Mosby. 1987, pp. 285-98.