A Review Of Pectoralis Major Musculocutaneous Island Flap In Head And Neck Reconstruction In Ibadan

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ABSTRACT

Like microvascular free flaps, pectoralis major flaps can be transferred in a single stage and have largely replaced deltepectoral (Bakanjian) flap in head and neck reconstruction. This retrospective study was carried out to highlight the usefulness of this flap in different situations. Ten patients, aged six to 55 years operated on in a six-year period at the University College Hospital, Ibadan are presented. Indications for surgery were gun shot trauma (2), pharyngocutaneous fistula (2), oesophageal stricture (2) and tumours (4). There was a 100% success rate. Neck web rate was 30% and these were revised at a second stage. Our modification to suit three-layer coverage is discussed. The pectoralis major muscle flap is a simple and reliable flap useful in head and neck reconstructions (Nig J Surg Res 2000; 2: 16-20)

KEY WORDS: Pectoralis major musculocutaneous flap, osseomusculocutaneous flap, head and neck reconstruction

Introduction

When local tissue cannot close a head and neck defect, the surgeon has to resort to distant tissue reconstruction. The choice lies between a pediced and a free tissue transfer. Free tissue transfer involves microvascular anastomosis, which requires expertise, and facilities, which are not available in most centers in the West African sub region. Reconstructive surgeons, therefore, often have to settle for the use of pedicled flaps in the repair of defects in the head and neck.

The use of pectoralis major flap has been established since it was first described by Ariyan in 1979. It's anatomy has been described by several authors. Apart from segmental supply by perforators from intercostals and internal mammary vessels, the sternocostal portion of the muscle is supplied by the pectoral branch of the acromiothoracic axis. This branch emerges medical to the insertion of pectoralis minor and runs laterally and inferiorly for a short distance in fatty areolar tissue. It then enters the deep surface of the muscle to run along with lateral pectoral nerve in an axis, which coincides with a line drawn the from tip of the shoulder to the xiphisternum. Based on the aforementioned vascular pedicles, the muscle can be transferred in different ways. For example, when detached from its origin, it can be turned over across the midline to cover a sternal defect such as that obtained after debridement for sternal osteomyelitis. The lower fibers of the muscle can be transferred with underlying rib(s) and a paddle of skin as a true island flap, which can be based on the pectoral branch of acromiothoracic vessel. This island of muscle and skin can be tunneled through chest and cervical tissues to reach its destination in the head and neck. Indications for this type of transfer are varied and this review presents such diversity as experienced in Ibadan in the reconstruction of head and neck defects.

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Patients And Method

Patients who had head and neck effects and who were operated on by the Plastic surgery unit sometimes in collaboration with Cardiothoracic surgery unit Otorhinolaryngology and Maxillofacial surgery departments of University College Hospital, Ibadan between January 1993 and September 1999 form the basis of this review. Information obtained were; age, sex, lesion or diagnosis, defect size, flap choice, flap outcome and complications.

Results

Ten patients had head and neck reconstruction with pectoralis major musculocutaneous and osseomuculocutaneous pedicled flaps. Age range was 6 - 55 years and M:F ratio 1:1. The indications for surgery (Figure 1) were post tumour excision 4, trauma 2, pharyngocutaneous fistula 2 and oesophageal stricture 2.

All, except case 2 (Table 1) had defects, which were covered with musculocutaneous flaps. Case 2 had an osseomuculocutaneous flap incorporating the right fifth rib, which was used for mandibular reconstruction. Cases 1,3,4 and 6, had the skin paddle used for oral lining. In these four cases, the muscle was covered with split skin graft harvested from the thigh. Both fistulae, after excision, and oesophageal stricture after release and excision, were lined by the skin component of the flap. The smallest defect was that obtained after excision of fistula and the largest, 9cm x 9cm, after excision of parotid adenocarcinoma.

Flaps that could be monitored through their skin paddles were seen to have developed no necrosis. There was excellent (>90%) graft take on those that were grafted. Cessation or absences of leakage in cases with pharyngoesophageal defects are indications of complete flap survival. Thus there was 100% flap survival rate in this series. There were no wound infections. Three patients had obvious skin webbing (Figure 2) over the pedicle. This necessitated revision procedure in which the pedicle was excised and the web skin rearranged by Z-plasties at a period greater than two weeks post operation.

Figure 1: Patient With Mandibular Osteosarcoma With Extensive Oral Mucosal Involvement

Figure 2: After Excision Of 70% Of The Mandible Including Island Flap Transfer. The Skin Paddle Has Been Used For Oral Lining. Note The Web On The Left Side Of The Neck.
PECORALIS MAJOR MYOCUTANEOUS FLAP IN HEAD AND NECK RECONSTRUCTION

Table 1: Summary Of Cases That Had Head And Neck Reconstruction At Ibadan

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Defect C</th>
<th>Closure</th>
<th>Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>F</td>
<td>Leiomyosarcoma of the right cheek</td>
<td>6cmx7cm</td>
<td>PMMCF+SSG</td>
<td>Sound dehiscence at oral commissure, lost to follow up</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>M</td>
<td>Gunshot injury, lip and mandible</td>
<td>6cmx7cm</td>
<td>PMOMCF</td>
<td>Died on 5th postoperative day from respiratory complication</td>
</tr>
<tr>
<td>3</td>
<td>32</td>
<td>M</td>
<td>Osteosarcoma, mandible</td>
<td>8cmx8cm</td>
<td>PMMCF-SSG</td>
<td>Skin web over pedicle, revised</td>
</tr>
<tr>
<td>4</td>
<td>55</td>
<td>F</td>
<td>Extensive left parotid adenocarcinoma</td>
<td>9x9cm</td>
<td>PMMCF+SSG</td>
<td>Dehiscence at oral commissure, web over pedicle; revised</td>
</tr>
<tr>
<td>5</td>
<td>55</td>
<td>F</td>
<td>Pharyngocutaneous fistula</td>
<td>4cmx5cm</td>
<td>PMMCF</td>
<td>Skin web over pedicle; revise</td>
</tr>
<tr>
<td>6</td>
<td>45</td>
<td>M</td>
<td>Gunshot injury, neck and mandible</td>
<td>4cmx7cm</td>
<td>PMMCF+SSG</td>
<td>Nil</td>
</tr>
<tr>
<td>7</td>
<td>50</td>
<td>F</td>
<td>Pharyngocutaneous fistula, post laryngectomy</td>
<td>6cmx3cm</td>
<td>PMMCF</td>
<td>Stricture; responded to bouginage</td>
</tr>
<tr>
<td>8</td>
<td>40</td>
<td>F</td>
<td>Squamous cell carcinoma, lower lip and mouth</td>
<td>6cmx5cm</td>
<td>PMMCF</td>
<td>Died 3 weeks postoperative from chest secondaries</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
<td>M</td>
<td>Oesophageal stricture after oesophagastrotomy</td>
<td>5cmx4cm</td>
<td>PMMCF</td>
<td>Initial leakage of dye on 10th day postoperative which stopped</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>M</td>
<td>Oesophageal stricture after oesophagastrotomy for corrosive stricture</td>
<td>5cmx4cm</td>
<td>PMMCF</td>
<td>Intestinal obstruction, sequela of previous operation</td>
</tr>
</tbody>
</table>

All donor sites were closed by direct suture. However, they healed mostly with stretched scars, especially in those who had large defects to cover. Nipple/areolar distortion occurred in cases 4 and 5. The patient that had an osseomusculocutaneous flap elevation required closed thoracostomy tube drainage. Subcutaneous drains were left longer than usual, approximately for five days. There were no subcutaneous collections or wound infection. There was wound dehiscence at oral commissure in both cases that had extensive lip coverage. Some of the major complications were unrelated to the flap reconstruction. These included intestinal obstruction in one of the patients who had undergone.

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Pectoralis major flap is most suited for head and neck defects that require bulk. In patients who have not had a neck dissection its passage through the neck sometimes produces a web, which usually requires a dissection and excision of the pedicle at a later date, at which time the flap may be inset. No such webbing was noticed in patients who had reconstruction in the neck like oesophageal and pharyngeal fistula closure. Transferring the pectoralis muscle as a true island flap with the skin paddle raised as far distally as possible produces an increased pedicle length and thus a greater arc of rotation, which in some of our patients reached the zygoma, and contralateral aspect of the lip at the same time.

In conclusion, we have highlighted the wide variety of indications for the use of pectoralis muscle flap in head and neck reconstruction. Some modifications based on local experience have also been discussed. Being a flap that is relatively easy to elevate and one that suffers minimal complications, it should be used more frequently in head and neck reconstruction, particularly where volume requirements are large as in many cases presenting in our environments.

References


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