Local Transposition Flap Repair of the Pectoralis Major Myocutaneous Flap Donor Site

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Since its first description in 1979,[1] the pectoralis major myocutaneous flap has become a versatile and reliable "workhorse" for head and neck reconstruction. We report a technique using a local transposition flap to close the pectoralis major donor site.

Design

A local transposition flap can be used to close a large donor defect. This is a medially based transposition flap. Although the flap is randomly patterned in design, there is a rich supply of cutaneous perforators in this region of the trunk. These include anterior perforators from the internal thoracic artery, perforators from the superior and inferior epigastric arcades that can communicate across the midline, the superficial superior epigastric artery (occurs only infrequently), and intercostal perforators. The secondary defect of the transposition flap is closed primarily.[2] The transposition flap described is similar in design to the thoracoepigastric flap.[3]

Case Reports

Case 1

A 74-year-old man presented with a fungating tumor and a matted lymph node mass (T4N3) involving his right upper neck, cheek, and pinna (Figs. 1 and 2). Biopsy confirmed squamous cell carcinoma. He underwent resection, including a right nearly total parotidectomy, right modified neck dissection, and right lateral temporal bone resection. This left a defect measuring 13 × 10 cm and extending to the level of the upper pinna (Fig. 3, *above*).

He underwent immediate reconstruction with a right-sided pedicled pectoralis major myocutaneous flap (Fig. 3, *center* and *below*). The flap was raised in the standard manner (Fig. 4, *above*). The skin paddle extended below the level of the muscle and was raised as a fasciocutaneous flap on the aponeurosis of the rectus abdominis in this region. The pectoralis muscle fibers were divided around the pedicle, which was raised with a small cuff of surrounding fascia to gain the required length for the pedicle (Fig. 4, *above, right*).

Fig. 1. Case 1. Squamous cell carcinoma close up.

Because the patient had tight skin on the anterior chest, only the superior part of the donor wound could be closed directly and the remainder of the donor site required a flap to facilitate its closure. A medially based, right-sided transposition flap was designed and raised using the excess skin of the right epigastrium and hypochondrium of the abdomen (Fig. 4, *second row, left*). The flap was raised as a fasciocutaneous flap.

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FIG. 2. Case 1. Tight anterior chest skin.

The flap was transposed into the donor site (Fig. 4, *second row, right*) and closed using 3-0 Monocryl buried dermal sutures and 4-0 Monocryl subcuticular sutures. The secondary defect in the abdomen was closed directly using the above sutures (Fig. 4, *third row, left*). A small dog-ear was created at the junction of the pivot point of the transposition flap and the inferomedial corner of the donor site; this was excised and closed primarily as the flap was inset (Fig. 4, *third row, right* and *below*).

Case 2

A 73-year-old man developed a left parotid mass and facial nerve palsy after previous excision of multiple cutaneous squamous cell carcinomata and a previous left superficial parotidectomy for metastatic squamous cell carcinoma. He underwent a left total parotidectomy and excision of the overlying skin (Fig. 5, *above, left*). This defect was closed with a pectoralis major flap (Fig. 5, *above, right*). The chest donor site was again unsuitable for primary closure of the entire defect. The chest defect after primary closure measured 12 cm in height and 8 cm in width and therefore underwent repair with a combination of a direct closure and a medially based transposition flap (Fig. 5, *center, left* and *right*, and *below*). The same technique was employed as outlined in case 1.

Case 3

A 72-year-old man developed a T3N0 mass in the right parotid region. He underwent a right superficial parotidectomy, modified radical neck dissection, and lateral temporal bone resection (Fig. 6). This left a skin defect measuring 13 × 8.5 cm. This defect was closed using the same technique as described in the two cases above.

DISCUSSION

Ariyan advocated undermining and advancing the lateral portion of the chest wall to enable the donor site to be closed primarily. In his first series of case reports, however, one of the four patients required an advancement flap to close the donor site.[1]

Skin paddles as large as 8 × 26 cm or 12 × 18 cm have been closed primarily.[4] This may require extensive undermining of the skin as far as the posterior axillary line and still result in closing the wound under tension. The donor site is more readily closed in women by moving the breast, although this may lead to asymmetry and deformity. Techniques are described to preserve the breast by elevating the breast skin and gland off the pectoralis major, then dissecting out a skin paddle on the inframammary portion of the myocutaneous pedicle before returning the breast to the chest wall.[5]

Other authors have described the use of split-skin grafting to cover the donor defect.[6]

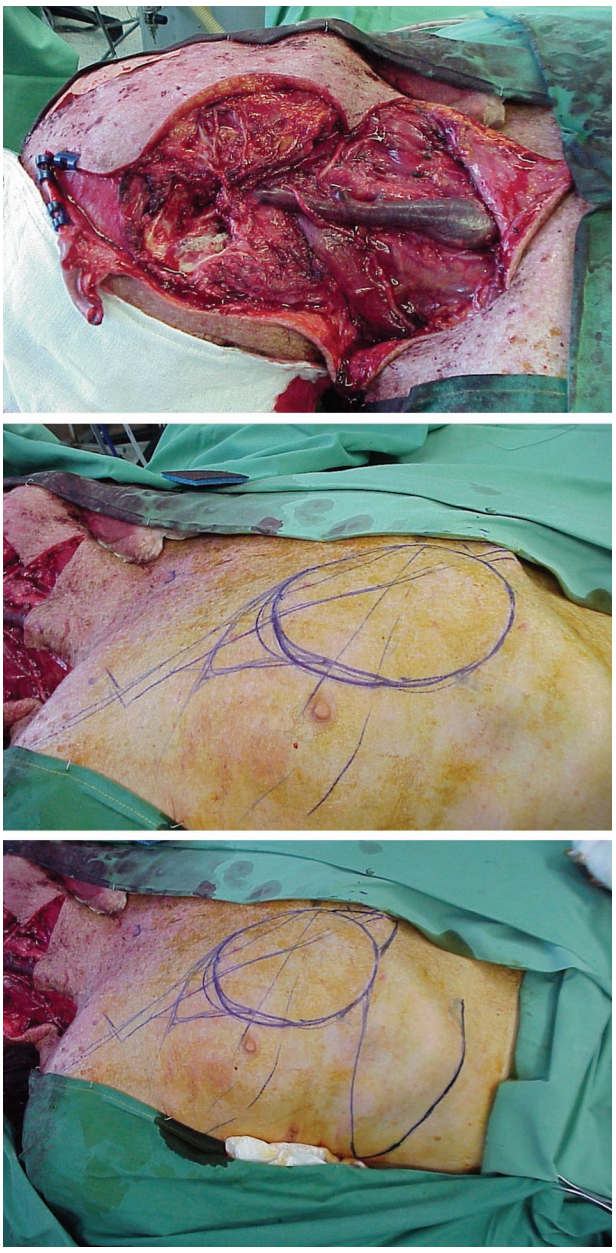
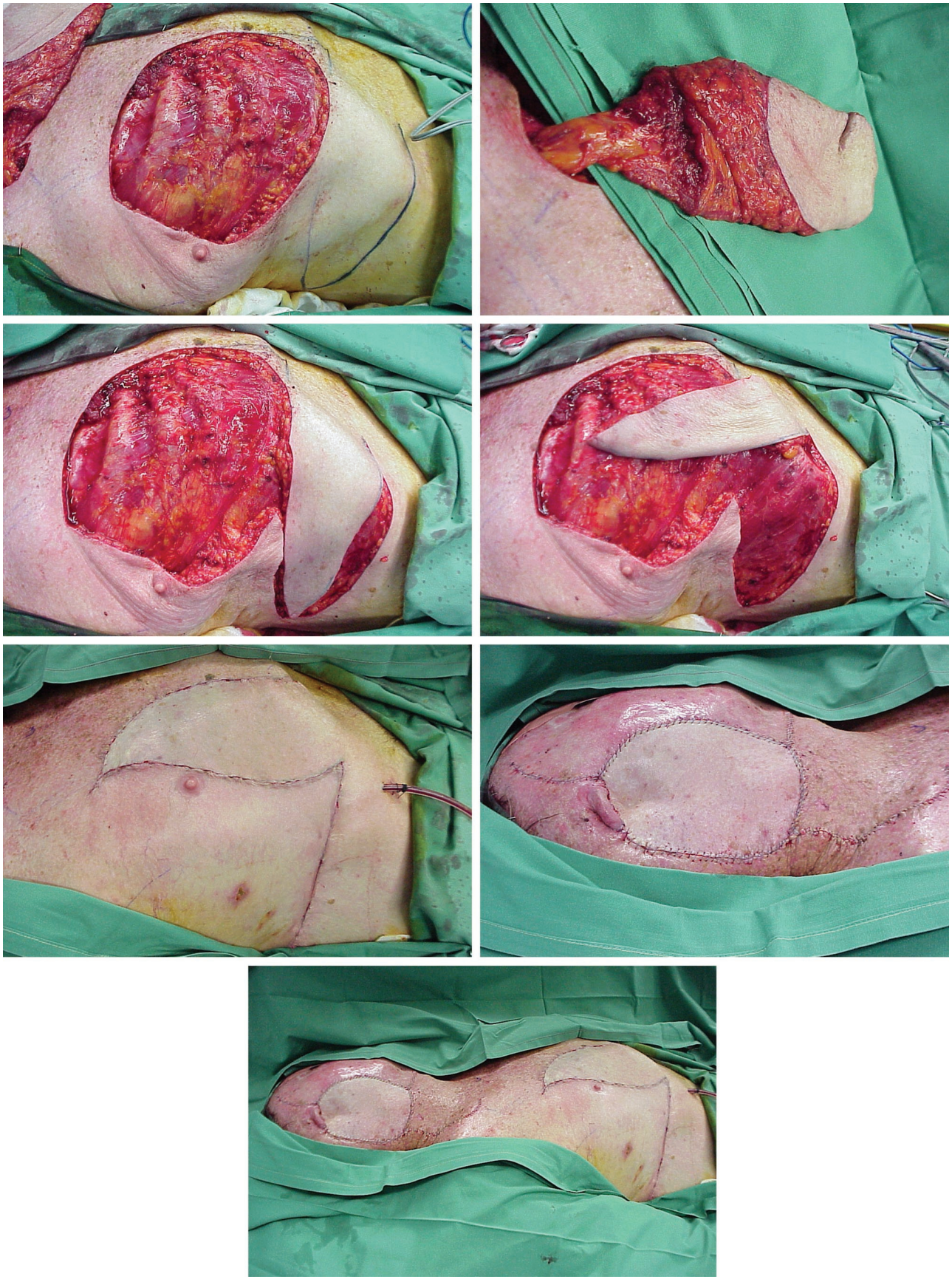


FIG. 3. Case 1. (*Above*) Neck wound measuring 13 × 10 cm. (*Center*) Pectoralis major flap design. (*Below*) Pectoralis major and transposition flap designs.



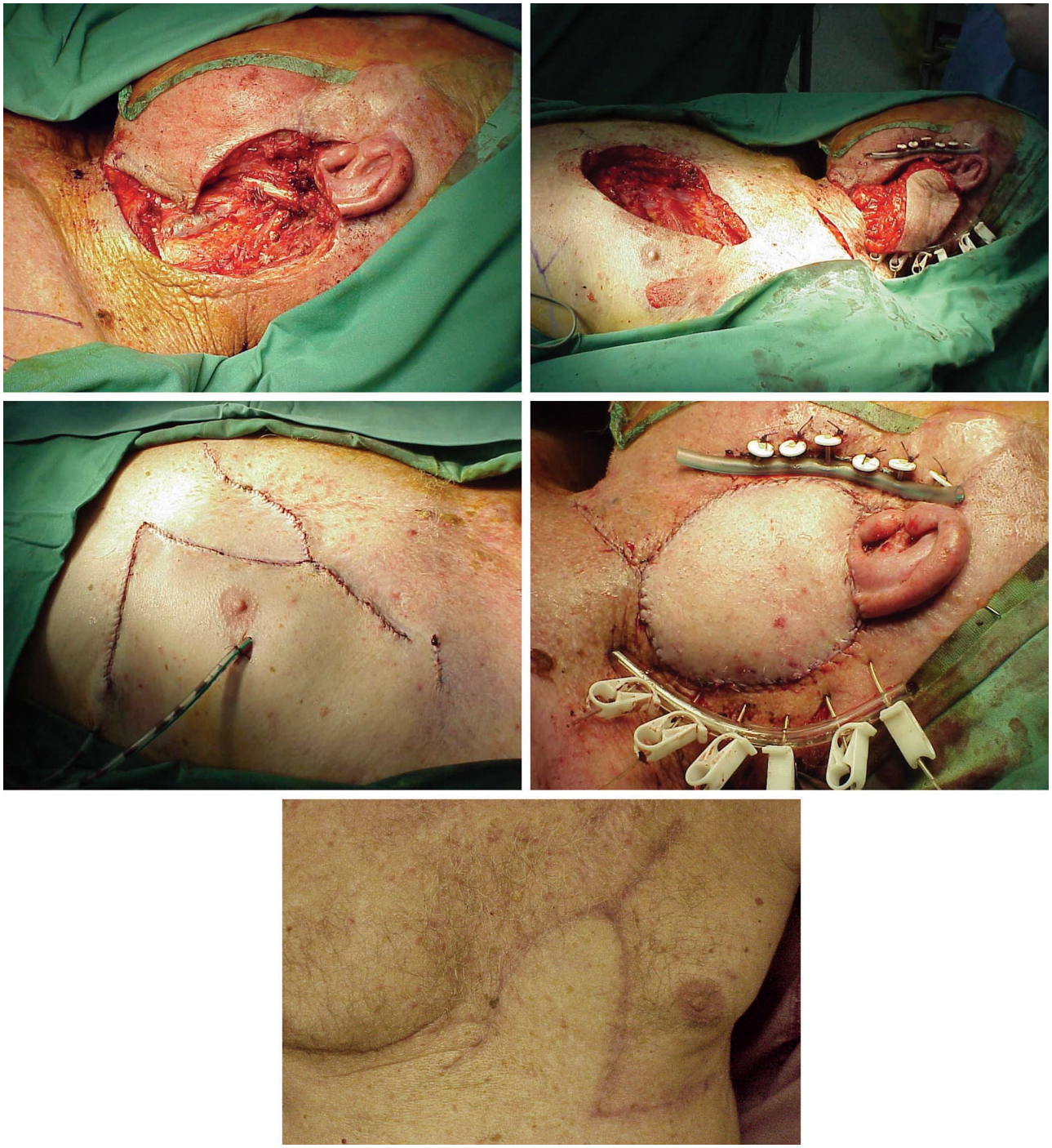


FIG. 5. Case 2. (*Above, left*) Left-sided neck wound after resection of squamous cell carcinoma. (*Above, right*) Neck wound after insertion of pectoralis major flap. (*Center, left*) Donor site after incomplete primary closure was repaired with a combination of direct closure and a transposition flap. (*Center, right*) Neck wound after insertion of pectoralis major flap. (*Below*) Donor site 88 days postoperatively.

FIG. 4. Case 1. (*Above, left*) Chest donor site after raising a pectoralis major flap. (*Above, right*) Pectoralis major flap raised on pedicle. (*Second row, left*) Transposition flap raised. (*Second row, right*) Transposition flap transposed to donor site. (*Third row, left*) Donor-site and secondary defects closed. (*Third row, right*) Neck wound with pectoralis flap sutured in situ. (*Below*) Neck, chest, and abdominal wounds closed.

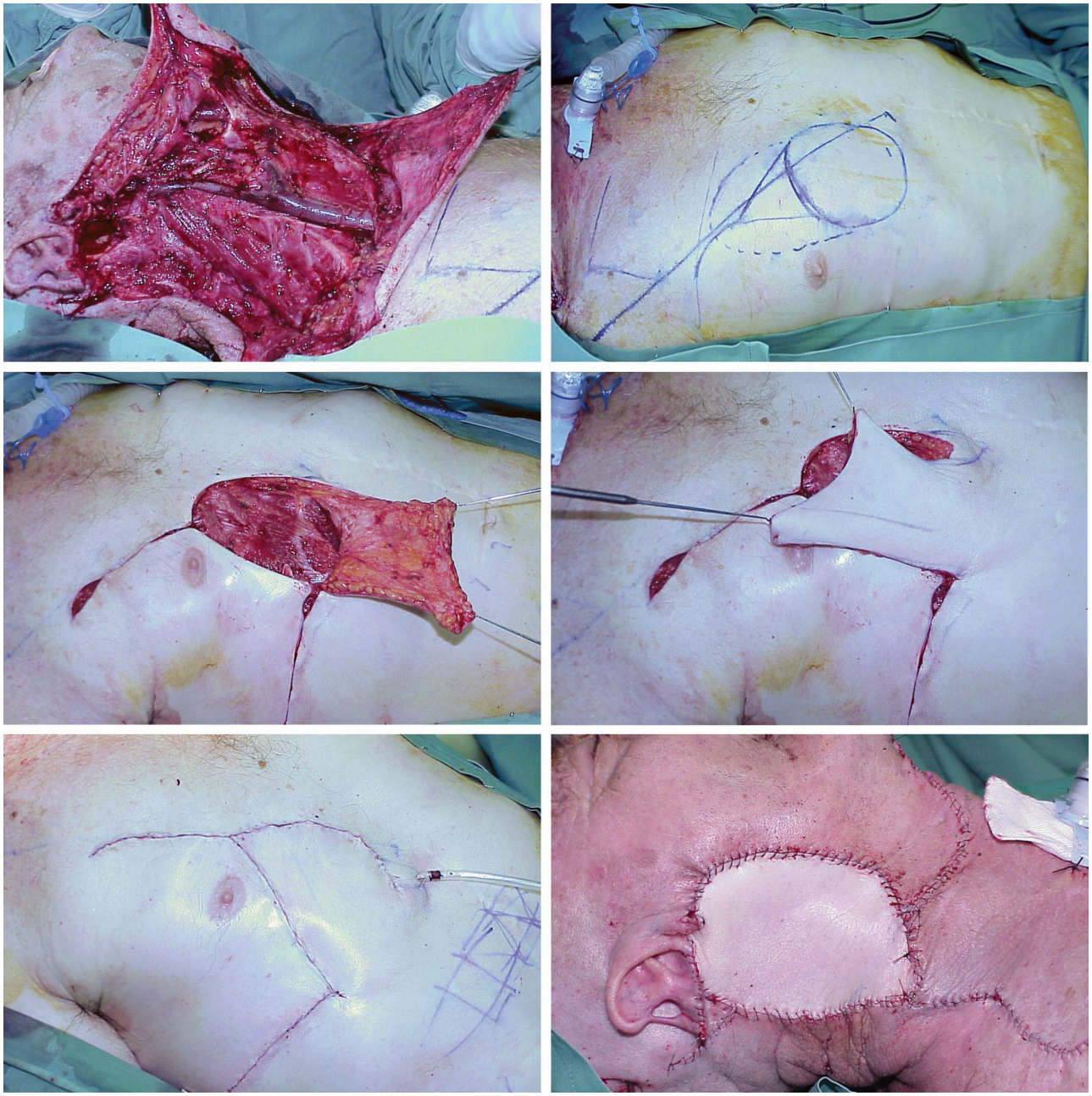


FIG. 6. (*Above, left*) Neck wound. (*Above, right*) Pectoralis major flap design. (*Center, left*) Chest donor site after raising abdominal transposition flap. (*Center, right*) Donor site after transposing abdominal flap. (*Below, left*) Donor site after closing transposition flap. (*Below, right*) Neck wound after closure with pectoralis major flap.

This is known to cause some morbidity in itself, which appears unrelated to the high propensity for this site to hypertrophic scarring and keloid formation. Additional complications include failure of the skin graft to take; this has been observed particularly in grafting over exposed costal cartilage.[7]

Other techniques employed to reduce the donor-site defect include crescentic skin paddles,[8] double skin islands with nipple-areola sparing,[9] and parasternal skin paddles.[10]

Most retrospective studies report few or no donor-site complications,[5,11,12] even when extended skin paddles are used.[13] The most common complications are chest wall hematoma formation and abscess formation. One of the most frequently seen non–donor-site complications reported is wound dehiscence in the head and neck. This may, in part, be attributable to the creation of too small a pectoralis flap skin paddle for fear of being unable to close the primary defect.

The three patients presented here had no complications in either the chest or abdominal donor sites. Direct closure of the entire chest donor site was not possible in any of the cases. The use of this local transposition flap allowed a tension-free closure of the donor site and thus avoided any donor-site morbidity.

The relative excess of skin in the epigastrium and hypochondrium enabled the secondary defect of the transposition flap to be readily closed in all three cases. There were no ischemic complications experienced in the transposition flaps, which illustrates the rich vascular supply to this area by medial perforators.

This medially based abdominal transposition flap appears to be a reliable and robust flap. As such, it is useful method that should enable larger pectoralis major flaps to be raised without an increase in donor-site morbidity.

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