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CASE REPORT

Dual perforator propeller internal mammary artery perforator (IMAP) flap for soft-tissue defect of the contralateral clavicular area[☆]

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Breast reduction

Summary The internal mammary artery perforator (IMAP) flap represents the evolution from axially pedicled flaps (deltopectoral flap) to perforator flaps. Both flaps are typically used for neck and tracheostoma reconstruction in male patients. We present the case of a 68-year-old obese female patient with a right upper thoracic radionecrosis secondary to breast irradiation. Soft-tissue defect measured 12 × 18 cm. She also complained of left breast hypertrophy. Following radical debridement, a left IMAP flap extending from midline to the anterior axillary fold was raised, based on the second and fourth IMAP vessels. The flap was rotated 180° on its second and fourth perforators to cover the defect and the left breast was reshaped. The flap survived entirely and wound healing was uneventful. Ptosis and breast hypertrophy were corrected at the same time. The IMAP flap can be harvested all the way to the anterior axillary fold and used as a large propeller flap, which makes this flap suitable for contralateral thoracic reconstructions, even in female patients.

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Background

The internal mammary artery perforator (IMAP) flap was conceptualised and coined several years before Yu et al. reported its first clinical application in tracheostoma reconstruction in 2006.¹ In the 'Gent consensus on perforator flap' terminology, presented at the Fifth International Course on Perforator Flaps, the IMAP flap was defined as a skin and subcutaneous fat flap supplied by muscle perforators arising from the internal mammary vessels.² It was listed among 18 other perforator flaps, some of which had never been reported.

Since 2006, several authors have reported the successful use of the IMAP flap, either pedicled or free.^{1,3–5} Using three- and four-dimensional computed tomographic angiography on cadaveric specimens, Wong et al. refined our knowledge of the arterial and venous perforasomes of the IMAP flap, and we bring here clinical data to support their anatomical findings.⁶

We describe here a case report of a thoracic radionecrosis, which was successfully treated using a large IMAP propeller flap. To our knowledge, this is the first report of the use of the IMAP flap as a propeller flap (180° rotation) in an over-weight female, performing a true breast perforator flap. Moreover, we isolated two perforators (second and fourth) of supra-millimetric calibre and kept them both, despite a rotation of 180°. Therefore, we performed a dual perforator propeller IMAP flap, which, to our best knowledge, has not yet been described.

Case report

The patient was a 68-year-old obese female, who suffered from secondary soft-tissue radionecrosis of the right upper thoracic and clavicular region. She had a previous history of right breast cancer, 25 years ago, treated by modified radical mastectomy and radiation therapy. In 2007, she presented with a first radionecrosis and was treated by a debridement resulting in a Halsted mastectomy. The defect was closed with an abdominal transposition flap, which partially failed. Exposed ribs were treated with vacuum-assisted closure therapy followed by split-thickness skin grafting. The skin-grafted area was stable and painless for 3 years. Almost 4 years later, she presented with recurrent ulcerating radionecrosis of the right upper thoracic area including a small area of exposed clavicle (Figure 1).

Her right arm was affected with a stable lymphedema for the past 20 years. Her body mass index (BMI) was 37 kg m⁻² but she was otherwise a healthy non-diabetic non-smoker female. She also complained of her left breast, which was hypertrophic and a source of trouble for her, with chronic fungal infections of the submammary fold.

The radionecrosis was excised and the necrotic clavicular bone was debrided. The subclavian vessels were preserved. The defect measured 12 × 18 cm. The left internal mammary artery perforators were located with a hand-held Doppler. A strong signal was heard on the second and fourth intercostal vessels. A large flap was outlined in the contralateral left breast in an oblique



Figure 1 Preoperative radiation-induced defect on right upper thorax.

downward and lateral direction, extending to the level of the anterior axillary fold (Figure 2). The flap measured 20 × 12 cm. The area of the flap included the upper pole of the hypertrophic and ptotic breast. Elevation of the flap began medially under magnification (2.5× surgical loupes), over the sternum, searching for the perforators. The IMAP vessels of intercostal spaces two and four were dissected. Both perforators showed an adequate calibre and measured over a millimetre in diameter (2.0 mm and 1.5 mm, respectively). The flap was dissected from lateral to medial, down to the superficial fascia, which was included

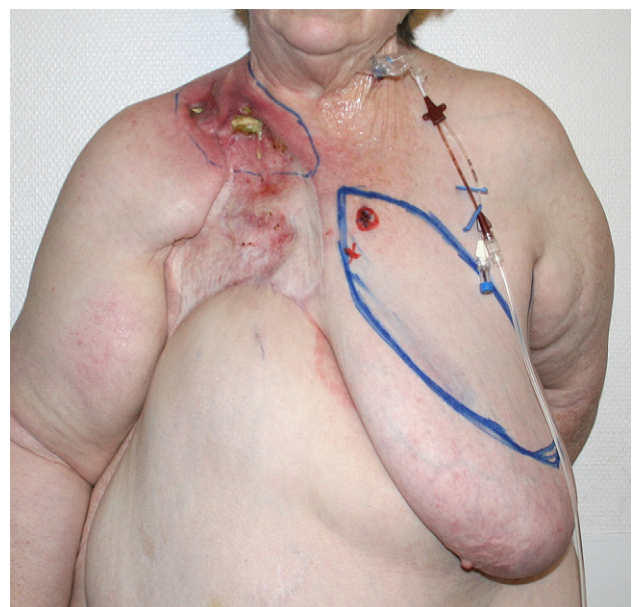


Figure 2 Preoperative IMAP flap design.

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