CASE REPORT

Oblique scapular flap

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Abstract
We report an axial transposition flap based on the anterior branch of the descending branch of the circumflex scapular artery. This has some advantages, including a hidden donor site, easy transfer with no abnormalities, no distortion of the structures, and much pliable tissue.

Key Words: Hidradenitis suppurativa, axilla, scapular flap

Introduction
The cutaneous territory of the circumflex scapular artery may be divided into three components; in other words, a flap based on the circumflex scapular artery can be designed in three directions. The medial territory of the scapular region is supplied by the transverse branch of the circumflex scapular artery that extends parallel to the spine of the scapula; the descending branch extends inferiorly along the edge of the scapula and supplies the inferior territory; the ascending branch extends superiorly and supplies the superior territory; and pedicled or island flaps based on these three branches have previously been reported for correction of contracture of axillary burn scars and for the treatment of axillary hidradenitis [1–6].

The anterior branch of the circumflex scapular artery has been used as a basis for a free scapular flap by Siebert et al. [7]. They showed that the anterior cutaneous branch courses anteriorly in the subcutaneous tissue to terminate on the anterior chest wall, and supplies the lateral territory.

Encouraged by the reliability and consistency of the anterior branch of the circumflex scapular artery, we developed the oblique scapular flap for axillary defects. We describe here the advantages of this flap and present a patient in whom two oblique scapular flaps were used to cover bilateral axillary defects that originated from radical excision of complicated hidradenitis suppurativa.

Dissection of the flap
In their cadaveric dissections, Siebert et al. [7] found at least one anterior branch that originated from the proximal descending branch of the circumflex scapular artery.

The triangular space was identified by palpation of the muscular hiatus at the lateral border of the scapula. The base of the flap was centred over the triangular space. An oblique line indicating the anterior branch (45° from the vertical axis) was drawn from the triangular space to the chest wall. An ellipse was drawn about 5 cm on either side of this line that extended from the chest wall (Figure 1).

The flap was dissected in suprafascial plane to a point of rotation and transferred to cover the defect of the axilla. The transferred tissue lacked the suspensory ligament that prevented prolapse of the flap, so the centre of the flap was sutured to the axilla to prevent its gravitational descent.

Although the circumflex scapular artery can be isolated, and the flap can be turned to an island flap for a greater mobility, we have not found it necessary. This also adds a degree of complexity. However, an island flap may prevent abnormalities of contour at the base of the flap in obese patients.
the greatest pitfalls leading to an unsuccessful outcome is inadequate excision. The ideal radical excision should include all involved and adjacent uninvolved apocrine gland-bearing tissue because the axillary apocrine glands are located not only within the hair-bearing area but also in the surrounding 2 cm of skin [9].

Radical excision often results in a large defect. Another factor leading to an unsuccessful outcome is underestimation of the size of flap necessary to fill the defect after wide resection. The true dimensions of the axillary defects are larger than the apparent defect. The axilla is three-dimensional, and has complex architecture. It is a roughly pyramidal space with an apex, a base, and four walls at the junction of the arm and thorax. The anterior wall is formed by pectoralis major and minor. The lateral border of pectoralis major forms the anterior axillary fold. The posterior wall is formed by the subscapularis above, and the teres major and latissimus dorsi below. The teres major and the latissimus dorsi form the posterior axillary fold. The lower borders of pectoralis major in the anterior wall and latissimus dorsi in the posterior wall are bridged by the tough axillary fascia, which forms the concave base of the axilla and the hollow of the “arm pit”. The axilla contains the axillary vessels, the infraclavicular part of the brachial plexus with its branches, and the lateral branches of some of the intercostal nerves. Given these considerations, the axilla can optimally be reconstructed by a large and pliable skin flap.

Larger defects of the axilla have been treated by either skin grafting or coverage by flaps. Skin grafts in the axilla do not provide the desired result for several reasons: the axilla is the flexor surface of the shoulder joint; it is known that grafts on the regions near the joints invariably contract; the adducted position of the axilla in the relaxed position makes contraction of the graft easier; skin grafts are difficult to apply to the concave surface of the axilla; the axilla is an important area because it contains the axillary vessels, the infraclavicular part of the brachial plexus with its branches, and the lateral branches of some of the intercostal nerves; a skin graft does not provide stable coverage for this area because the axilla has a frictional surface; and other disadvantages of skin grafting include dryness and the need for prolonged immobilisation.

Local flaps raised from the chest wall and the upper arm may resurface limited skin defects of the axilla. We think that these flaps should not be used for large defects of the axilla because the skin of the upper chest and the medial aspect of the upper arm contribute to full abduction of the arm. The range of

**Case report**

A 37-year-old man presented with bilateral axillary suppurative hidradenitis (Figure 2a, b). The movement of his shoulders was limited to about 90°. Bilateral oblique scapular flaps (about 10 × 12 cm and 12 × 15 cm in size) were used to reconstruct his axillae after wide excision of the lesion and release of the contracture. The flaps healed uneventfully (Figure 2c, d). The patient regained a satisfactory range of movement in his shoulders (Figure 2e). The aesthetic appearance of the axillae was acceptable. The scars of the donor site were well-hidden (Figure 2f, g).

**Discussion**

The use of the anterior branch rotates the axis of the scapular flap anteriorly, so the oblique scapular flap is adjacent to the axillary defect. The oblique scapular flap combines the principle of transposition with skin sliding. As stated by Schruedde and Petrovici [8] this combination permits closure of a wound with a flap that is smaller than the original defect. Theoretically, tilting the axis of a flap to a more oblique position gives additional length. Other advantages of the flap include: decreased movement on the wound compared with the parascapular flap scar; the scar of the donor-site is well hidden; it does not cause distortion of the adjacent structures; the resection and dissection of the flap can be done in the lateral decubitus position; a large amount of pliable tissue can be raised; and donor sites up to 10 cm in width can be closed easily.

In hidradenitis suppurativa of the axillae, minor operations have had a high recurrence rate. One of

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**Figure 1.** Diagram showing the oblique scapular flap.
Figure 2. (a) Hidradenitis suppurativa of the left axilla. The movement of the shoulder was limited to about 90°. (b) Hidradenitis suppurativa of the right axilla. The movement of the shoulder was limited to about 90°. (c) Late postoperative view of the left axilla. (d) Late postoperative view of the right axilla. (e) The patient regained a satisfactory range of movement in his shoulders. Note the hidden scar. (f) Lateral view (left). (g) Lateral view (right).
movement of the shoulder may be compromised by a scar at the donor site.

In reconstructing this complex region, the oblique scapular flap satisfies many requirements.

References