Thoracodorsal artery perforator (TAP) type I V-Y advancement flap in axillary hidradenitis suppurativa

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Summary

Hidradenitis suppurativa is a chronic debilitating disease. Surgical removal of all apocrine glands in the affected region is the definitive treatment. The resulting wound may either be left to heal secondarily or closed primarily. Secondary healing in the axilla may cause contractures and stiffening of the shoulder. Primary healing requires direct closure, split-skin grafting or local flap application. Direct closure is associated with a high incidence of recurrence compared to skin grafting or flaps. Local flap cover is the ideal method of wound closure after excision of the glands. We have used a thoracodorsal artery perforator (TAP) V-Y advancement flap (type I) to achieve closure as a single-stage procedure successfully in four cases. It is a single stage procedure capable of closing large axillary defects whilst preserving the axillary contour.

Surgery is the treatment of choice for hidradenitis suppurativa. Soldin et al. have shown that excision of all hair-bearing skin in the axilla is sufficient to eradicate the disease with a low incidence of recurrence. Local flaps have already been described to reconstruct the defects but these have a low length to width ratio. Perforator-based flaps have also been described with improvement in reliable soft tissue cover of the axillary vessels and aesthetics of the axillae. We have been able to cover these defects without resorting to the equal or unequal double opposing V-Y advancement flaps (types 2a and 2b). A single V-Y advancement flap based on the consistent and reliable musculo-cutaneous perforators of the thoracodorsal artery has been sufficient to close the defect after the removal of all hair-bearing skin down to the axillary vessels in our patients with good results.

Method

With the patient in the lateral position and the ipsilateral arm abducted at 90°, 2-3 perforators along the anterior border of the latissimus dorsi...
were located using a hand-held Doppler device. The vascular territory encompasses a quadrilateral area (Fig. 1) bordered superiorly by the third rib, inferiorly by the seventh rib, posteriorly by the lateral scapular border and anteriorly by the mid-axillary line. A single V-Y advancement flap based on the marked out musculo-cutaneous perforators of the thoracodorsal vessels was planned as shown in Fig. 2.

All hair-bearing skin in the axilla was excised down to the axillary vessels (Fig. 3). The V-Y flap was dissected sub-fascially beginning anteriorly.

Next, the superior border of the flap was elevated and finally its posterior border. Once islanded, the flap was dissected sub-cutaneously until it was sufficiently mobile to close the primary defect. No additional effort was taken to isolate the perforators as the flap advanced comfortably. Once haemostasis was achieved, the flap was closed from below upwards starting with the secondary defect, gradually coaxing the flap into a diamond shape as shown in Fig. 4. The flap was then inset using subcutaneous and subcuticular absorbable sutures. A single drain was inserted posteriorly.

Peri-operative antibiotics were administered for up to one week after surgery. We found that defects of up to $12 \times 8 \text{ cm}^2$ could be closed using this technique with sufficient freedom of movement at the shoulder joint. All patients were discharged within 48 h after removal of the drains.
Case reports

Case 1
A 51-year-old woman who was diabetic, hypertensive and a smoker presented with a seven history of recurrent abscesses in the right axilla. After excision of hair-bearing skin, the defect was closed with a TAP V–Y advancement flap. She was discharged within 2 days post-operatively and was given peri-operative antibiotics for a week.

Case 2
A 36-year-old woman who was a smoker presented with bilateral axillary and groin abscesses for 12 years, resistant to antibiotic treatment. The lesion on the left was excised and a type I V–Y TAP flap from the lateral chest wall was applied to the defect. The right axillary lesion was excised and left to heal secondarily. The flap drain was removed the following day and she was discharged within 2 days on peri-operative antibiotics for a week. At 2 weeks post-operatively, the flap had healed and she had functional use of the left shoulder (Fig. 5(a) and (b)).

Case 3
A 46-year-old woman who was a smoker presented with bilateral hidradenitis suppurativa of the axillae for 12 years resistant to antibiotic treatment. The axillary hidradenitis suppurativa was excised on each side with an 18-month interval between surgeries. Post-operatively, the left axillae healed well. There was recurrence of the disease on the right which required re-excision.

Discussion
Several different types of advancement and transposition flaps for reconstruction after excision of axillary hidradenitis have already been described. We describe a simple convenient and reliable flap to preserve form and function. Niranjan et al. have described two techniques, the lateral perforator based V–Y advancement flap and the double-opposing V–Y advancement flap based on the posterior arm and the lateral chest wall perforators. However, the narrow vascular pedicle and the inconsistent course of these perforators make them unreliable. Schwabegger et al. have been used the similar V–Y advancement flap but based on random perforators.

The flap described here is a perforator flap based on the musculocutaneous branches of the thoracodorsal vessels which supply the latissimus dorsi muscle and the skin over the muscle. In our cases, we found no need to dissect down to the thoracodorsal vessels as one would in a typical TAP flap although this is an option for larger defects. Baudet et al. showed that this system of vessels was highly reliable, easily located, present in all cases and with large vessel diameters. Angrigiani et al. described free perforator flaps based on the thoracodorsal artery which preserved the latissimus dorsi muscle. Original cadaveric studies show that an axial pattern fascio-cutaneous flap can also be taken on one or two vessels arising as direct septocutaneous branches from the thoracodorsal vessels. Unfortunately, these are present in only 47% of cases and therefore not suitable to base the flap on.

The advantages of the TAP flap are that it is reliable and reproducible as the scapular-thoracodorsal arterial system is robust and predictable. Dissecting sub-fascially preserves the fascial plexus thus allowing a length to width ratio of 3:1. The vascular system supplies a large quadrilateral paddle of skin (shaded area in Fig. 1) which allows it to close large defects. There is no need to immobilise the shoulder and the scar is easily hidden along the posterior axillary fold. Furthermore, it provides excellent contour and texture match whilst preserving the axillary fold.

Unlike Schwabegger et al. we have not needed to include muscle in the flap or to dissect out the perforators to close the axillary defects. This has resulted in a simpler and safer flap and we...
recommend its use in clinical practice for the treatment of axillary hidradenitis suppurativa.

References