Split-thickness skin grafts and negative-pressure dressings in the treatment of axillary hidradenitis suppurativa

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SUMMARY. Although a number of different reconstructive techniques have been described for the treatment of axillary skin defects, split-thickness skin grafting continues to be the most common surgical modality. Here, we present our recent experience of using split-thickness skin grafts together with negative-pressure dressings for the management of defects following wide surgical excision of severe hidradenitis suppurativa. This technique ensures complete skin-graft take whilst allowing full shoulder mobility, thereby minimising the undesirable sequelae associated with split-thickness skin grafting alone. © 2002 The British Association of Plastic Surgeons

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Hidradenitis suppurativa, the aetiology of which is uncertain, is a chronic recurrent suppurative disease of the apocrine sweat glands that principally affects the axillary and anogenital regions.1,2 The morbidity associated with the established form of this disease is significant,3,4 and the only successful treatment is wide surgical excision.5–7 The axillary apocrine glands are located not only within the hair-bearing area but also in the surrounding 2 cm of skin.6 As a result, a large skin defect follows adequate excision. Although a number of different reconstructive procedures have been described, no preferred form of surgical treatment has been adopted.6,7 Despite various methods of dressing and shoulder immobilisation, the use of split-thickness skin grafts to close such defects is almost invariably fraught with partial or complete graft loss.5,7 Thus, grafting is often associated with prolonged shoulder immobilisation and hospitalisation, the need for repeated dressings and healing by secondary intention, with consequent scar contracture and a reduction in shoulder mobility.7 As an alternative, various local fasciocutaneous flaps have been described in recent years.7–9 However, flap coverage is associated with both an unacceptable donor-site scar and a higher recurrence rate than wide local excision and skin grafting.7

Patients and methods, and results

Five patients suffering from long-standing severe unilateral axillary hidradenitis suppurativa were treated during 2001 (Fig. 1). The affected skin was widely excised, including the whole of the hair-bearing area, a 1–2 cm thick subcutaneous layer of adipose tissue and the axillary fascia if inflammation and fibrosis reached that layer. The surgical defect was reconstructed with a split-thickness skin graft in each case. The graft was harvested from the medial aspect of the contralateral thigh using an air-driven dermatome, and was subsequently meshed in a ratio of 1.5:1. After application to the recipient site, the graft was fixed to the wound margins with staples or absorbable sutures (Fig. 2). In each case, the Vacuum Assisted Closure (VAC) device (KCI, San Antonio, TX, USA) was used to secure the meshed graft in place. This entailed placing a sponge dressing into the wound, sealing the site with an adhesive drape and transmitting topical negative pressure to the wound in a controlled manner.10,11 This allows uniform application of pressure to the skin graft in order to minimise the shear forces that may impair its adhesion and

Figure 1—A 34-year-old female patient with severe hidradenitis suppurativa of the axilla. The area for excision has been outlined.
vascularisation. The polyurethane-sponge dressing provided was trimmed to the specific wound geometry. A single layer of Vaseline gauze was placed over the skin graft and below the sponge dressing. The distal end of the evacuation tube was embedded into the reticulated sponge, and the wound and sponge were covered with an adhesive drape to create an airtight seal (Fig. 3). The proximal end of the evacuation tube was connected to the canister attached to the adjustable vacuum pump. A continuous subatmospheric pressure of 75 mmHg was applied to the wound.10

During the VAC dressing period, each patient was allowed to mobilise fully and upper-limb movement was not restricted. All found the dressing comfortable. Any transudate from the wound was able to egress through the meshed graft and sponge to the canister. On the fifth postoperative day the VAC dressing was removed; it separated easily as a result of the gauze barrier between the sponge and the graft. In four out of the five wounds the grafts had completely taken (Fig. 4). In places, buds of granulation tissue protruded through the mesh interstices, but these regressed quickly, allowing complete

Figure 2—The axillary defect is covered with a meshed split-thickness skin graft, which is fixed to the wound edges with staples.

Figure 3—The VAC sponge and the embedded distal end of the evacuation tube are covered with an adhesive drape to create a sealed wound environment. On transmission of negative pressure the sponge shrinks to give the characteristic ‘crinkled’ look.

Figure 4—On removal of the VAC dressing a healthy axillary wound demonstrates almost complete graft take. In places, buds of granulation tissue protrude through the mesh interstices, but these regress quickly.

Figure 5—The site of the axillary wound approximately 8 months after grafting, with the shoulder in abduction. Although some circumferential scar contracture has occurred, an axillary depression is maintained.
epithelialisation within 4 days of removal of the VAC. In one case, where the chronic wound was grossly contaminated preoperatively, the graft take was approximately 80%, and the wound epithelialised fully within 10 days. The follow-up period varied between 2 months and 8 months. The range of motion of the shoulder was unaffected in all cases (assessed by comparison with the contralateral side) (Fig. 5).

Discussion

In advanced cases of hidradenitis suppurativa, conservative therapies are usually ineffective. Minor surgical procedures, such as incision, drainage or limited local excision and primary closure, have an unacceptably high recurrence rate. Therefore, wide surgical excision and reconstruction is required.

The reconstruction of large axillary skin defects is challenging because of the wide range of shoulder movement. Various surgical options are available. Traditionally, skin grafting required a period of immobilisation, with potential shoulder rehabilitation problems. Moreover, failure of skin grafting, defined as less than 50% take, occurs in 45% of grafts despite delayed application and adequate immobilisation.

As a result of the inherent difficulties with skin grafting to the axilla to date, the popularity of local flap reconstruction has grown. Medial and posterior arm and lateral thoracic fasciocutaneous flaps have been used for small axillary defects, whilst larger defects usually require a pedicled parascapular flap. Flap coverage is not without its disadvantages, however. Local flaps cannot adequately cover large defects, and both these and, in particular, parascapular flaps often leave an unacceptable donor-site scar, especially in women. Moreover, they tend to bulge (especially in obese patients) and droop because they lack the suspensory ligament of the normal axilla. Furthermore, there is a higher recurrence rate associated with flap reconstruction than with skin grafting. A tendency towards more limited excision and/or the importation of adjacent or ectopic pilosebaceous glands when using such flaps may account for this. Also, injury to the intercostobrachial and median cutaneous nerves of the upper limb is more likely.

As a result of the work of Argenta and Morykwas, the VAC technique has become an accepted part of the armamentarium of the reconstructive surgeon in recent years. In both clinical and experimental studies, the application of subatmospheric pressure to wounds has been shown to remove interstitial wound fluid loaded with destructive inflammatory products and significantly decrease bacterial colonisation, while quadrupling the blood flow in the wound bed and accelerating the rate of granulation-tissue formation. More recently, its use has been extended to securing skin grafts to difficult recipient beds.

The use of VAC in the treatment of chronic axillary hidradenitis suppurativa allows these attributes to be applied to a wound type where they are most needed; i.e. an infected, chronically inflamed and mobile wound bed. Heretofore, poor graft take in this region, healing by secondary intention and scar contracture, combined with attempts to immobilise the shoulder by splintage, have led to varying degrees of stiffness in this susceptible joint. Our technique not only ensures a remarkably high percentage graft take in these wounds but also allows normal shoulder movement throughout, thus ensuring that shoulder mobility is not compromised. Furthermore, an axillary depression tends to be recreated. Some circumferential scar contracture takes place, but this is not necessarily disadvantageous, as it confines the scar tissue to the inconspicuous axillary region. Although this study cannot be considered statistically significant, we envisage that, with more widespread application, this technique will be shown to be the most effective and appropriate means of treating the axillary defect that follows excision of hidradenitis suppurativa.

References


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