The lateral thoracic fasciocutaneous island flap for treatment of recurrent hidradenitis axillaris suppurativa and other axillary skin defects

A. H. Schwabegger, E. Herczeg* and H. Piza

SUMMARY. A series of eight axillary skin defect reconstructions in seven patients using the lateral thoracic island fasciocutaneous flap is presented. The defects originated from wide excision of recurrent hidradenitis axillaris suppurativa and in one case from radical melanoma resection with axillary lymph node clearance. The technique used to cover the resulting large defects is advancement or transposition of an island flap from the lateral thoracic wall, pedicled on two or three nourishing vessels arising from the lateral thoracic or thoracodorsal vessels. No flap complications occurred and the results with respect to donor site morbidity, functional and aesthetic outcome were very satisfactory. © 2000 The British Association of Plastic Surgeons

Keywords: axillary skin defect, hidradenitis suppurativa.

Cover of large skin defects in the axillary fossa is challenging due to the range of shoulder movement, which may be compromised by scar contracture resulting from inadequate surgery. A variety of surgical options are available after failure of conservative attempts to treat recurrent hidradenitis axillaris suppurativa and other axillary skin defects. Simple direct closure after adequate radical excision is usually not feasible and the application of sheet or meshed skin grafts in many cases leads to unfavourable aesthetic results as well as functional impairment by scar contracture, which is reported in up to 70% of cases. Additionally, skin graft application requires a certain period of immobilisation, with potential shoulder joint rehabilitation problems. The three-dimensional architecture of the axillary fossa, which changes its shape significantly during arm movement, needs pliable skin replacement without scar contracture. This can optimally be achieved by the use of large skin flaps. A variety of fasciocutaneous or musculocutaneous regional flaps for different indications in this region have been described with their inherent advantages and disadvantages. The surgical anatomy of the lateral thoracic region has been well investigated with respect to pedicled or free flap harvest. Regional pedicled flaps based on the underlying vessels commonly serve for correction of axillary burn scar contracture and for the treatment of hidradenitis axillaris suppurativa. We describe the use of a lateral thoracic fasciocutaneous island flap based on vessels arising from the thoracodorsal or thoracic lateral vessels, a reliable technique that has not yet been described for the treatment of hidradenitis or tumours of the axillary fossa.

Patients and methods

Between October 1997 and October 1998 seven patients were treated with eight flaps and followed up retrospectively. There were five females and two males. Six patients suffered from recurrent axillary hidradenitis, one patient bilaterally. In one male, an en bloc resection of a malignant melanoma of Clark level IV (Breslow thickness, 4 mm) with axillary node clearance was performed. Radical excision was performed after a period of at least 5 years of recurrent disease in the hidradenitis cases and immediately after diagnosis in the tumour case. The patient with bilateral reconstruction underwent two separate operations at an interval of 5 weeks. Prior to flap incision, detection of flap nourishing vessels by Doppler sonography or Power Doppler imaging was performed. In the series presented, two or three supplying vessels were dissected and were sufficient for flap viability. Physiotherapy of the affected shoulder started on the first postoperative day. Follow-up in the hidradenitis cases ranges from 8 to 15 months and is 4 months in the tumour case.

Anatomy

Several small vessels originating from either the lateral thoracic vessels or the cutaneous branch of the thoracodorsal vessels supply this axial pattern island fasciocutaneous flap. Depending on the distance of advancement or transposition, the vessels may be dissected more proximally, close to the branching from the major vessels, or even based on them. Baudet et al described the successful transfer of this flap as a free thoracodorsal axillary flap, but due to an inconstant vessel supply this flap has not gained popularity as a free flap. However, as a pedicled island flap, based on several branches, there is no concern about the origin of neighbouring vessels that arise from the axillary region to which the flap has to be transferred.
Surgical technique

Prior to surgery, the cutaneous vessels supplying the skin island are detected by a simple Doppler device or by Power Doppler imaging and marked with non-soluble ink. The rhomboid shaped affected skin (range: 35–120 cm²) is then radically excised (Fig. 1), including all the apocrine sweat glands and the whole of the hair-bearing area with a subcutaneous layer of adipose tissue 1–2 cm thick occasionally also including the fascia if inflammation and fibrosis reaches that layer. A cutaneous flap of corresponding size caudal to the defect between the anterior and posterior axillary lines is incised, taking care to include the marked vessels. It is raised as an island flap based on the ascending vessels (Fig. 2) and inset as an advancement or transposition flap into the defect in the axilla. The thickness of the flap depends on the depth of resected tissue. The axillary fascia may be included as well as the subcutaneous tissue adjacent to the pectoralis major muscle to increase vascularity via the lateral thoracic artery. If the flap is too bulky, a subcutaneous lipectomy may easily be performed under direct vision, avoiding vessel damage. Advancement or transposition by rotation from 90–180° along the vascular axis depends on the local situation and the distribution of the nourishing flap vessels as well as the range of motion required. The skin borders are incised and sutured in a multiple-Z fashion (Fig. 3) in order to avoid circular scar contracture and to promote reinnervation through the elongated border line. The donor site is closed by direct suture, which may be achieved by moderate undermining. We do not recommend performing flap transposition on both axillae simultaneously because of the resulting tension.

Results

There were no surgical complications in terms of vessel damage or flap viability. All flaps healed without complications and there was no recurrent disease or scar contracture within the follow-up period. The mean postoperative hospitalisation was 4 days and, due to early physiotherapy starting on the first postoperative day, no impairment of shoulder movement occurred in the early or late postoperative period. The aesthetic results of both the reconstructed area and the donor site have been satisfactory, subjectively and objectively.

Discussion

Important advantages of the subaxillary island fasciocutaneous flap over alternative local and regional flaps are rapid dissection, avoidance of dog ears, mobility, range of motion and direct closure of the donor site in a hidden area. No functional impairment of the shoulder occurs because no muscle is transposed and early mobilisation of the shoulder joint is possible, in contrast to skin graft application. Compared to the scapular, posterior arm and pectoralis major flaps, the donor site is well hidden behind the arm in neutral position, and compared to local transposition flaps, no bulging, dog ears or potential mammary distortion are caused (Figs 4 and 5). The indication for this flap is reconstruction of any wide defect in the axillary fossa, most frequently caused by excision of chronic hidradenitis suppurativa and occasionally after wide tumour resection. This flap may be inset by simple advancement, or, depending on the requirements of area and contour reconstruction, by rotation. The versatile range of motion is a significant advantage over other regional island and random pattern flaps, which are limited in their arc of rotation due to a distant vascular pedicle and the preservation of a cutaneous flap base, respectively.
In obese patients vessel identification is facilitated with a hand-held Doppler probe. In these patients the flap itself tends to be bulky but contouring by lipectomy gives satisfactory results.

Acknowledgements

We gratefully thank Dr Erich Brenner for support in performing the anatomic studies at the Institute of Anatomy, University of Innsbruck.

References


The Authors

Anton Herbert Schwabegger MD, Associate Professor and Consultant Plastic Surgeon
Hildegunde Piza MD, Professor and Head
Universitätsklinik für Plastische und Wiederherstellungschirurgie, University of Innsbruck, Anichstrasse 35, A-6020 Innsbruck, Austria.

Emilia Herczeg MD, Registrar
Krankenhaus der Stadt Wien Lainz, Wolkersbergenstrasse 1, A-1130 Vienna, Austria.

Correspondence to Professor Dr Anton H. Schwabegger.

Paper received 4 February 2000.
Accepted 18 July 2000, after revision.