Surgical treatment for venous ulcers: is it worthwhile?

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We have reviewed the results of treatment of 159 consecutive limbs presenting with a clinical diagnosis of venous ulcer in 140 patients (70 male, aged 28-90 years, median 66 years). Of the patients, 61% were referred because of severe pain and 53% of the ulcers had been present >2 years. Patients were evaluated clinically and by Doppler, with selective use of venography, photoplethysmography, arteriography and latterly duplex scanning. Seventy-one limbs had surgery to the superficial veins, 18 limbs had arterial reconstruction, and 10 limbs had skin grafting alone. There was one operative death after arterial reconstruction but none after venous surgery.

Patients were followed up for 1-5 years (median 3 years). Of those who had been treated surgically, healing was achieved in 88%, and ulcers healed in 52% of those treated non-operatively. In all, 18% of the ulcers recurred in each group.

These results show a favourable association between appropriate venous and arterial surgery and the healing of venous ulcers, with relief of pain. They support a policy of thorough evaluation and appropriate surgical treatment in these patients.

Venous ulceration is a common problem, particularly among the elderly, with an estimated prevalence of up to 1% (1,2). The condition is chronic and since many patients require regular dressings for long periods it places a considerable and costly burden on the Health Service (3). Healing may be achieved by rest and elevation, compression bandaging or by surgery, although any of these may be followed by recurrence (2-5). Nevertheless, appropriate venous surgery can produce worthwhile rates of healing (6), and arterial reconstruction may also be indicated in some cases.

It has always been our policy to offer operation to selected patients with venous ulcers, particularly if they are in pain. The majority require operations for varicose veins and incompetent perforators, while arterial reconstruction is recommended if ischaemia is judged to be a factor in perpetuating an ulcer. Details of all these patients have been collected prospectively with a view to long-term follow-up.

Knowledge of our surgical results assumed increasing importance when the dermatologist for the Exeter district, with whom we work closely, coordinated publication of a document about prevention and treatment of ulceration, and supervised the setting up of leg ulcer bandaging clinics. Advice was sought from the consultant vascular surgeon (WBC) on explicit indications for surgical referral, which was given, based on current practice. This advice clearly needed support from knowledge of the longer-term results achieved locally by surgical treatment. We wanted to ensure that the results justified recommendation of operation as an alternative or sequel to bandaging.

Patients and methods

All patients with leg ulcers referred to the vascular surgical clinic between 1 January 1987 and 31 December 1991 were identified from prospective handwritten records of outpatient diagnoses. The patients included in this study were those with a clinical diagnosis of 'venous ulcer' on presentation. Those with ulcers thought to be primarily of arterial or diabetic aetiology (for
example ulcers on the heel or the foot), were excluded, as were patients with ulcers with a suspected vasculitic origin.

Patient details, definitive diagnosis and treatment were obtained by review of the case notes. In all, 140 patients were reviewed (70 male) aged 28–90 years (median 66 years). There were 159 ulcerated limbs.

Pain from the ulcer was the primary reason for referral in 85 patients (61%). Ulcers had been present for longer than 2 years in 74 patients (53%). A previous history of deep vein thrombosis or pulmonary embolus was elicited in 16 patients (11%).

All patients had been evaluated at initial presentation to the outpatient clinic by clinical examination and by use of an 8 MHz hand-held Doppler. The Doppler evaluation included assessment of the long and short saphenous veins, calf perforators and the popliteal (deep) veins; the distal arteries were also examined by Doppler in all patients. Further investigations were carried out selectively. Ascending venography was used in patients with a history suggesting deep venous thrombosis or with any evidence of calf perforator incompetence by Doppler, to confirm the presence, size, and exact site of incompetent perforating veins. Photoplethysmography was used to assess global venous function in cases with questionable venous disease, and arteriography was requested in patients with evidence of arterial insufficiency. In the latter part of the review period, duplex scans were obtained in selected patients, particularly those with incompetent veins in the popliteal fossa, to differentiate more clearly between short saphenous and deep vein incompetence.

Patients were selected for operation if they had surgically correctable superficial venous incompetence, or significant arterial ischaemia which was amenable to reconstruction.

Follow-up was by a detailed postal questionnaire. If this was not returned or if questions were left unanswered, patients’ general practitioners were contacted to obtain details. Deceased patients’ details were traced through the Family Health Services Authority and general practitioners. Patients who had amputations for their ulcers were excluded from follow-up. The questionnaire assessed ulcer healing rates and recurrence in patients treated surgically and conservatively.

Patients were also invited to comment on their hospital management. We aim to educate patients about the nature of their condition and its treatment, but it is often difficult for patients to grasp that an ulcer at the ankle requires venous surgery with incisions in the groin and elsewhere on the leg. Patients were asked whether they had received an explanation about the problems with their veins and indications for treatment.

### Results

Saphenofemoral incompetence was demonstrated in 75 limbs with ulcers. Popliteal fossa reflux was detected in 54 limbs—this was judged to be because of short saphenous incompetence in 42 limbs and popliteal vein incompetence in 12 limbs. However, this assessment was by hand-held Doppler only throughout much of the review period, and some patients in whom short saphenous incompetence was diagnosed may have had incompetence in the popliteal veins; this differential diagnosis was elucidated by duplex in the last year of the study only. Co-existing arterial disease was present in 30 patients (21%).

Thirty-five patients (25%) had received previous treatment, including venous surgery (20), sclerotherapy (10) and sympathectomy (5).

Of the 159 ulcerated limbs, 52 (33%) were managed conservatively and 107 (67%) surgically. Ninety-five (68%) patients had operations. Venous surgery was performed in 71 limbs (82 procedures)—details are presented in Table I. The majority had superficial venous surgery and only 11 had formal division of incompetent calf perforators. Arterial reconstruction was performed in 18 limbs, skin grafting alone in 10 limbs, and one limb had a sympathectomy. Seven additional skin grafts were carried out at the time of venous or arterial surgery. Seven limbs were amputated for extensive and painful ulceration; most of these patients had a flexed or useless limb. The 30-day mortality after venous surgery was zero: one patient died after a femoropopliteal bypass and one after a below-knee amputation (mortality for all patients having operations 2.1%).

At follow-up of 1–5 years (median 3 years), 107 patients were available for review. Of the 33 patients not available for follow-up, four patients had moved away, 25 patients had died and in four the affected limbs had been amputated.

Questionnaires were completed and returned by 102 patients (114 limbs), a response rate of 95%. An adequate response about healing at the time of completion of the questionnaire was provided for 91 limbs, of which 68 were managed surgically. The overall ulcer healing rate was 79% with a recurrence rate of 18%. The surgically treated group had a higher healing rate at 3 months and at final follow-up compared with patients managed conservatively (Fig. 1). After venous surgery alone, the ulcer healing rate was 84%.

Ulcers recurred in 11 limbs (18%) after surgical treatment. This group was predominantly female (seven of the nine patients) with a median age of 69 years. The majority (73%) had surgery for longstanding ulcers (more than 2 years duration) and 91% had a history of previous

### Table I. Details of venous surgery; note that some limbs had more than one procedure

<table>
<thead>
<tr>
<th>Operation type</th>
<th>Number of limbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long saphenous ligation and/or stripping</td>
<td>48</td>
</tr>
<tr>
<td>Short saphenous ligation</td>
<td>5</td>
</tr>
<tr>
<td>Long and short saphenous surgery</td>
<td>13</td>
</tr>
<tr>
<td>Edwards’ procedure</td>
<td>5</td>
</tr>
<tr>
<td>Cockett’s procedure</td>
<td>6</td>
</tr>
<tr>
<td>Multiple avulsions and unspecified</td>
<td>5</td>
</tr>
</tbody>
</table>
ulcers, but has been (9,10). Healing rates for surgical group. (a) Healing rates for surgical group. (b) Healing rates for non-surgical group.

ulceration. In all, 45% had a history of previous surgery or sclerotherapy. Among the patients with recurrent ulceration, 67% had continued to wear support stockings or bandaging after operation.

The questionnaire responses indicated that the patients were pleased with their hospital management. Of the patients, 88% said that they had received and understood an explanation given at the first consultation, and 89% were satisfied with the results of surgery.

Discussion

The association between leg ulcers and venous disorders has been recognised for centuries (7,8). Several theories have been proposed to explain the pathogenesis of venous ulcers, but the exact mechanism is still the subject of controversy (9,10). Healing of ulcers in the long term and prevention of recurrence should be possible by accurate diagnosis and correction of the underlying venous abnormality. Incompetent calf perforators have traditionally been regarded as a major factor in the genesis of venous ulcers, but perforator surgery advocated by Linton in 1938 (11) (subfascial ligation) and by Cockett and Elgin Jones (12) (extrafascial perforator ligation) may be necessary only in a minority of patients.

Many ulcers can be healed by conservative treatment with compression bandaging, and the majority of patients reported in this study had had conservative treatment. Patients with ulcers who had not had compression bandaging were considered for primary surgical treatment, particularly if they were thin, relatively fit, and had obvious varicose veins. Those who were obese or unfit were generally encouraged to attempt conservative measures first, but were assessed for surgery if their ulcers were longstanding or painful. We particularly encouraged our dermatological colleagues and general practitioners to refer patients if they were in pain and/or unable to tolerate compression, hence the relatively high proportion of painful ulcers in this series. Since recurrence, pain and failure to heal were the indications for operation in the majority of cases, our study included a typical mixture of elderly, unfit, and obese patients.

The main venous abnormalities detected in our patients were long and short saphenous incompetence. Of patients managed surgically 71/107 (66%) limbs required venous surgery and 66 (93%) of these had simple superficial venous procedures. Our practice is long saphenous vein ligation at the saphenofemoral junction and strip from the groin to just below the knee. Superficial varicose veins are removed by phlebectomies through small stab incisions and we now ligate the peripheral tributaries of each length of varicose vein to minimise bleeding and haematoma formation. When short saphenous incompetence is suspected on initial Doppler examination, duplex mapping is performed to confirm the diagnosis and define the anatomy. The junction of the short saphenous vein with the popliteal vein is clearly marked on the skin, and at operation the short saphenous vein is ligated close to the popliteal vein.

Duplex scanning allows confirmation of deep venous incompetence which might otherwise be confused with short saphenous incompetence using the hand-held Doppler; duplex is more accurate than attempting to use tourniquets in the clinic to make this distinction. If deep vein incompetence is confirmed, we always advise long-term graduated compression stockings (usually below the knee). During the period of this study it was our practice to advise continued wearing of compression hosiery (using Class 2 below-knee stockings) after operation for patients with mixed superficial and deep vein incompetence, in whom only the superficial veins had been dealt with. Patients in whom severe superficial venous incompetence had been corrected were told that they no longer required compression. We now feel that patients with a history of recurrent ulcers may be better advised to continue with graduated compression despite successful surgery, but this is controversial and is in practice influenced greatly
by patient preference. At follow-up, 40% of the surgical group and 71% of the conservative group had continued to wear some form of support.

Counselling patients is important. We explain the nature of venous ulceration to them and the reasons for surgical intervention. We always emphasise that healing is not guaranteed and that recurrence is a possibility in the longer term. The majority of patients (87%) said that they had understood the preoperative explanation of the purpose of surgery of venous ulcers and were satisfied with the results.

Careful case selection using clinical and Doppler examination supplemented by duplex scanning, and the other tests described, allows identification of correctable venous and arterial pathology in patients with venous ulcers. Surgery in our hands has been associated with a worthwhile rate of healing, with a low incidence of recurrence during the first few years. These results have encouraged us to pursue our present policy on selected patients. We recommend surgical referral for patients with ulcers if they have obvious varicosities or evidence of arterial insufficiency. We particularly advocate referral of those patients who have severe pain. With a low operative mortality, we see age as no bar to surgery for patients whose ulcers are a severe burden to them.

References


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