

Leg Ulcers: Report on a Multidisciplinary Approach

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In a Swedish survey, leg ulcer disease has been found to have a prevalence of around 1%. The multifactorial etiology requires a multidisciplinary approach. Forty-three patients with leg ulcers have been examined clinically and by pathophysiological and roentgenological investigations. Proper conservative treatment was instituted in 25 of the patients, and the remaining were treated by venous surgery, arterial surgery and skin transplantation. The previously used therapy only achieved healing in 23% of these patients, but after multidisciplinary assessment and treatment the healing rate was improved to 83%. The ulcer-free period of the whole group was 62% during a follow-up of 24 (3–36) months. The healing of venous ulcers can be improved by a multidisciplinary assessment by a vascular surgeon and a dermatologist. Key words: dermatological treatment; venous surgery; arterial surgery; skin transplantation.

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In a Swedish survey, 1.1% of the population older than 25 years was found to suffer from leg ulcer disease. The problem increases with age, with a prevalence of leg ulcers of 2% at an age above 60 years (1, 2). The point prevalence of open leg or foot ulcers treated within the Swedish health care system varies between 0.12–0.3% (3, 4). At least an equally large number seems to exist outside the system (4). In the Lothian and Forth Valley study (5), 70% of the ulcers were considered to be of venous origin and 21% due to arterial impairment. A more recent survey (6) confirms the predominance of venous ulcers but states a lower prevalence of 40% and impaired arterial circulation in 16%. A mixed venous and arterial origin was stated in 21%.

At the dermatological leg ulcer clinic 260 patients are treated each year. Out of these patients a group was selected by the dermatologist as possible candidates for vascular surgery in order either to heal refractory ulcers or prevent the recurrence of otherwise healed ulcers. These patients underwent a multidisciplinary approach by a dermatologist and a vascular surgeon. For optimal treatment radiological investigations and pathophysiological investigations were often required. The present report advocates a multidisciplinary approach to leg ulcers, with the goal of improving the healing rate and reducing recurrences for the benefit of the patient and the community.

MATERIALS AND METHODS

Patients

The first 43 patients (28 women, 15 men) with ulcers that were examined are reported. Their median age was 74 (35–92). Twenty-one per cent of the patients had previously had deep venous thrombosis (DVT), 7% had rheumatoid arthritis and 14% had diabetes mellitus. Twenty-

nine per cent were smokers and 18% had intermittent claudication. The patients had had their first ulcer 3 months to 60 years before examination at the leg ulcer clinic; the mean was 4.3 years. The present ulcer appeared at a mean time of 11.5 (0.5–60) months before visiting the leg ulcer clinic. Ten of these ulcers had already healed at the time of examination.

Ten out of 43 patients had previously been treated with some type of venous surgery, and 5 out of 43 with arterial surgery. The treatment used immediately before the joint examination was in 41 cases conservative. Conservative treatment comprised 17 double-layer bandages, 3 hydrocolloid dressings (HCD), 12 HCDs combined with compression bandages, 2 vaseline gauze dressings and 7 vaseline gauze dressings combined with compression. In 2 patients pinch grafting had been performed, with success in one.

Ten ulcers had healed with previous treatment, 13 had improved but did not heal and 20 had deteriorated or were unchanged.

The patients were followed for a median of 24 (3–36) months. The 8 patients that died during the follow-up are included in this report. All patients that were alive at follow-up had been followed for at least 9 months.

Methods

Clinical investigation included examination of ulcer size and distribution, examination of the veins with auscultation with a hand held ultrasound doppler over the popliteal vein and ankle pressure measurement when indicated. The presence or absence of ulcers was recorded during follow-up. The ulcer-free period was defined as the time without ulcers as a percentage of the total follow-up time. The results are also subdivided according to presence or absence of ulcers at the first visit.

Duplex ultrasonography (Accuson 128 XP/IO; Accuson, Mountain View, Calif, USA) was performed in 10 patients where deep venous incompetence was suspected or when a post-thrombotic state needed further investigation. Some cases of suspected perforating vein incompetence were also examined in this fashion.

Contrast phlebography (3 patients) was used as an auxiliary procedure, mostly where duplex was not sufficient or where a detailed anatomical visualisation was needed.

Conventional angiography was performed on the aortoiliac and leg arteries in 5 patients.

Pathophysiological investigations, such as venous pressure measurement and measurement of reflux and muscle pump function by e.g. foot volumetry, were performed in 6 patients.

Etiology of ulcers

After all the investigations had been taken into account, a reasonable etiology was determined and thereafter therapeutic actions were taken. The etiology was considered to be venous in 18 (42%), arterial in 12 (28%) and combined venous and arterial in 6 (14%) patients. Arterial insufficiency was based on clinical examination; and in cases of purely arterial insufficiency the ankle brachial index (ABI) was 0.53 (0.41–0.76) and in cases of combined arterial and venous insufficiency the ABI was 0.50 (0.44–0.54). One patient presented with the clinical picture of primary atrophie blanche, i.e. atrophie blanche without venous insufficiency, a painful non-leukocytoclastic small vessel disease without systemic vasculitis (7). In 5 patients hydrostatic ulcers were found, i.e. ulcers located between knee and ankle without evidence of arterial or venous insufficiency or small vessel disease background (8). In one case subcutaneous ossification after trauma was found to be the reason for ulcers. In the 6 patients with diabetes 5 were considered to have arterial ulcers and one a hydrostatic ulcer.

Therapy

The therapy was conservative in 25 patients. Conservative treatment included 9 HCDs and compression, 5 double layer bandages, 5 compression hosiery, 4 HCDs without compression, 1 HCD with double-layer bandage and 1 vaseline gauze with compression.

Arterial surgery, including interventional radiological procedures, were performed in 4 patients, venous surgery in 4. Skin transplantation was performed in 10 patients, as a split skin graft (2 patients) or pinch graft (8 patients). Two of the skin-transplanted patients were in addition reconstructed arterially.

RESULTS

Overall healing rate

In the whole group of patients, 36 of 43 (84%) were healed at follow-up (Fig. 1). The ulcer-free period was 62%.

Among the patients that did not have ulcers at their first visit (10 patients), there was only one recurrent ulcer, which healed again in 3 months during follow-up, giving an ulcer-free period of 90%. Twenty-six of the 33 patients (79%) that had ulcers initially were healed at follow-up, with an ulcer-free period of 51%.

According to etiology

The majority of ulcers were of venous or arterial etiology. Ulcers due to purely arterial insufficiency (12 patients) healed in 83% and those of venous origin (14 patients) in 78%. The patients with ulcers due to a combination of venous and arterial insufficiency (6 patients) and the group with ulcers of hydrostatic origin (5 patients) were all healed at follow-up.

Patients with ulcers of combined arterial and venous origin had the longest ulcer-free period (73%), followed by venous (70%), hydrostatic (61%) and arterial (50%) ulcers.

The patients that had open ulcers at the first visit had inferior results, compared to the total group, regardless of the etiology of the ulcer. This is also illustrated by the fact that in patients that did not have ulcers at the first visit there was only one ulcer recurrence.

According to therapy

The therapeutic results are stated according to the most important therapy, although in several cases more than one therapeutic action was taken.

Conservative treatment alone healed ulcers in 20/25 (80%), with an ulcer-free period of 60%.

Four patients treated with venous surgery all healed (100%) and had an ulcer-free period of 90%. Arterial surgery accomplished healing in 2 patients where this was the major therapy, and in 2 patients arterial surgery was combined with skin grafting with resultant healing in one of them. The ulcer-free period was 59% and 36%, respectively. Eight patients were treated by skin transplantation, without other surgery, with healing of all ulcers (100%) and an ulcer-free period of 65%.

DISCUSSION

The etiology of leg ulcers varies according to many factors, such as socioeconomic status, age, urban or rural areas. In Nelzén's et al (6) survey, investigating all ulcer patients in a defined area, i. e. not selected from a particular speciality, the dominant reason

for leg ulcers was found to be venous insufficiency in 40%, arterial insufficiency in 16%, and ulcers of more or less mixed venous and arterial type in 21%. The etiological spectrum of leg ulcers at the leg ulcer clinic at the department of dermatology differs in this respect, showing a dominance of venous ulcers (87%) followed by arterial (9%) and mixed ulcers (4%). The present patient material reveals a predominance of venous insufficiency (42%) followed by arterial insufficiency (28%) and ulcers of mixed venous and arterial origin (14%) and thus differs from the usual etiological spectrum seen at the department of dermatology, resembling more the general, cross sectional spectrum.

Treatment of ulcers is costly and, as shown already by Gjörös (9), it also implies absence from work and other socioeconomic problems. Better treatment improving the healing rate would decrease the cost and be of great importance to the patient.

Extensive investigations are sometimes indicated to find the causative factors for ulcers. With a multidisciplinary approach, decisions on proper investigations and therapy can be made rapidly, with possible reduction of morbidity. Both patients that have had ulcers and patients with present ulcers can benefit from such an approach. The goal is to increase the ulcer-free period, in patients without present ulcers by reduction of recurrences and in patients with present ulcers to also reduce the time to healing. Our results show that these two groups are not quite comparable to each other. One reason for this is that those who had open ulcers at the initial visit had had the underlying disease for a longer time, with first appearance of an ulcer up to 60 years before present treatment. In contrast, the patients with healed ulcers at the initial visit had had their ulcers for up to 20 years.

Comparing the results of the previously used therapy, prior to multidisciplinary evaluation, to the results from the present therapy shows the benefit of this approach. With previous therapy only 23% were healed, and after the present therapy 84% had healed. Those that had leg ulcers initially (33 patients) healed in 79%, and there were no leg ulcers at follow-up in those that did not have ulcers at the first visit.

Therapeutic actions can only partially correct the underlying pathophysiological abnormalities, and ulcer recurrences are to be expected. The ulcer-free period is reported because the time to recurrences or merely the presence or absence of ulcers does not properly reflect the severity of the disease. The ulcer-free period therefore gives a better estimation of the morbidity and the results than only registration of healing at follow-up. This method of assessment has previously been used in similar reports (10).

The ulcer-free period of the whole group was 62%. The patients that were healed at the first visit had a longer ulcer-free period than those that had ulcers, i.e. 98% compared to 51%.

Subdivision according to the etiology revealed that the combined venous and arterial ulcers and those of purely venous origin had the longest ulcer-free period following therapy.

The combined ulcers were treated by skin transplantation in 2 patients and in one by arterial reconstruction. The venous insufficiencies were treated by venous surgery in 4 patients and in one by skin transplantation. The ulcer-free period according to therapy shows the same tendency, i.e. better results for ulcers where venous surgery or skin transplantation is applicable than

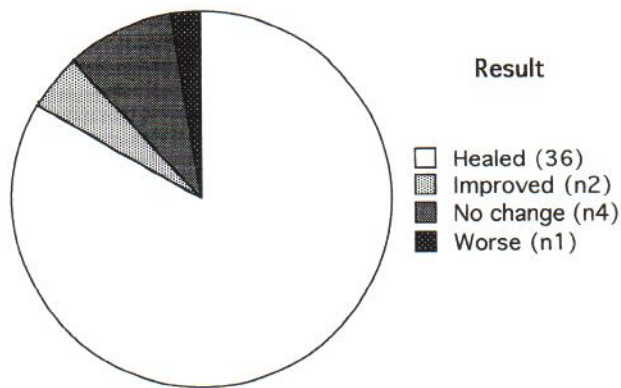


Fig. 1. Healing results with the therapy used after multidisciplinary assessment at the leg ulcer clinic in 43 patients.

for the other forms of treatment. This supports the view that venous surgery on superficial veins has a preventive effect on recurrences of ulcers (10–13). The patients that were treated by arterial reconstruction, however, were healed at follow-up in 3 of 4 cases, although they had a comparatively shorter ulcer-free period. Strikingly enough, in these patients, selected as being possible candidates for vascular surgery, “conservative” treatment was chosen in 25 out of 43 patients and was sufficient for primary healing in 80% (ulcer-free period 60%).

A multidisciplinary approach to leg ulcers provides a better use of investigative resources, improves healing and increases the ulcer-free period. It has an educational value between specialties, but above all, it can decrease patient morbidity and is therefore of great socioeconomic value.

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