

Novel strategies in the Surgical Management of Chronic Leg Ulcer

Chronic ulceration of the leg is a common disease, especially among the elderly, affecting up to 1% of the population. Until recently, management of ulcers was rarely based upon scientific principles. Marketing pressures often determined the choice of wound-dressings irrespective of their efficacy. In the past ten years several studies have shown that most ulcers are the results of several etiological factors operating together.

Although the majority of ulcers are caused by venous insufficiency, concomitant arterial disease is underestimated. Recent advances in duplex Doppler ultrasonography allow the rapid, non-invasive functional and anatomical assessment of both the venous and arterial systems of the lower limb. With this technology at hand we studied 223 consecutive patients with the diagnosis of chronic leg ulcer. 22% of these patients with a primary diagnosis of „venous leg ulcer“ had co-existing severe arterial disease. Furthermore 12% were purely arterial. Therefore we conclude that it is necessary to identify ulcers with an arterial component, not only because many of them will heal after improvement of the arterial circulation but also because inappropriate compression bandaging of these legs may have deleterious consequences that can lead to critical ischemia.

It has been shown that foot and lateral calf ulcerations are predominantly caused by arterial disease. In our series, we were able to establish three typical locations, namely lateral calf, pretibial area and the dorsum of the foot that yielded a sensitivity of 100% for the appropriate identification of an “arterial” leg ulcer, at a specificity of 45%. Therefore we strongly recommend to record the location of the ulcer in order to distinguish ulcerations confined to the leg gaiter area from those involving the foot.

The next important issue we addressed in our series is to determine the treatment option in the setting of impaired ankle pressures (AP) above the threshold of chronic critical limb ischaemia (CLI). We refer to this setting as a therapeutic “grey area” since treatment options are still not clearly defined. If a leg ulcer occurs in the setting of CLI (Ankle pressure ≤ 60 mmHg, toe pressure ≤ 30 mmHg), the natural history is as poor as in the classical situation of distal toe or foot necrosis in Fontaine Sage IV peripheral occlusive disease (POD). In our experience, however, the majority of patients suffering from leg ulcers in POD do not meet the criteria of CLI and therefore the limb is not immediately threatened, i.e. by amputation. On the other hand the potential of conservative wound healing is impaired at ankle pressures ≤ 80 -100 mmHg or at systolic toe pressure ≤ 40 mmHg.

Up until today, the management of arterial leg ulcers in this “grey area” above the threshold of CLI is only poorly defined. This prompted us to analyze a series of 26 patients with “arterial leg ulcers” with special regard to the clinical presentation,

vascular assessment and treatment outcome. In 31% conservative treatment and/or split skin grafting was successful. 69% of patients with recalcitrant leg ulcers had to have revascularisation procedures. Healing of the ulcer was achieved in all but one patient. The present results confirm the existence of a “grey area” above the threshold of CLI, when an ulcerated viable leg is not threatened, but conservative wound healing is unlikely to occur due to impaired perfusion.

Thus, the effective management of these patients calls for reproducible means of identifying patient subsets that will benefit from a vascular procedure or conservative treatment. From our studies it becomes obvious that the ankle pressures (AP) and the ankle-brachial pressure indices (ABI) respectively, are of little help in identifying these subsets (ROC for AP and ABI, 0.72 and 0.68 respectively). Future studies and other tests from the vascular laboratories will be necessary to discriminate these patients. Based on our extensive experience with difficult to treat leg ulcers we propose a step-wise management: vascular assessment should be performed at the beginning of any leg ulcer treatment. The indication for revascularisation therapy is given if the criteria of CLI are fulfilled. Otherwise a conservative approach is justified in patients with small wound surface and minor pain. If the wound does not heal within a short time (e.g., four weeks) of optimal conservative treatment, debridement and split skin grafting should be considered. If the wound bed is not suitable for split skin graft despite efficient debridement, the patient should be evaluated for revascularisation.

Among patients with vascular disease, those with rheumatoid arthritis and systemic sclerosis represent a particular sub-group with a high incidence of leg ulcers. They usually have long-standing collagen-vascular disease and their leg ulcers are difficult to treat. In larger studies concurrent POD and venous insufficiency were reported to occur in one third to one half of the patients. Astonishingly these results have hardly been translated into therapeutic consequences. Obviously the treatment of their leg ulcers remains rather ill-defined. We assessed 15 consecutive patients who suffered from leg ulcers in the setting of collagen vascular disease. Our analysis focused on the prevalence of relevant vascular disease as well as on the effect of treatment of large-vessel disease on wound healing. Vascular procedures (i.e., revascularisation a/o saphenectomy and endoscopic perforator surgery) were performed in six of nine patients with rheumatoid arthritis and in five of six patients with systemic sclerosis. Healing or major improvement of the leg ulcer was achieved in seven of nine patients with rheumatoid arthritis and in five of six patients with systemic sclerosis. This indicates that surgery of both arterial and venous macrocirculation improves healing rates as compared to conservative treatment alone in difficult-to-treat patients with collagen-vascular diseases. These results should encourage dermatologists, rheumatologists and particularly surgeons to become more active

with this patient population. Thus, prospective trials are needed to confirm the effectiveness of these strategies.

Venous ulcers represent the largest group amongst patient with leg ulcers (39% in our population of 223 consecutive patients). The value of surgery of superficial and perforator veins in the management of chronic venous insufficiency remains controversial. Current concepts often suggest that primary varicose veins never can give rise to venous ulcers. The development and application of modern vascular laboratory techniques like duplex ultrasound scanning has improved the assessment of reflux in both the deep and superficial systems as well as the examination of perforator veins. We evaluated a series of 79 consecutive patients with leg ulcers. Half of these patients (47%) showed a postthrombotic deep venous reflux and in 32% of the cases there was a combined superficial and deep incompetence. The remaining 21% of patients had an isolated superficial venous reflux while the deep system was competent confirming that superficial venous reflux is a major single cause of chronic venous insufficiency. All of these patients healed after saphenectomy and endoscopic perforator ligation. No recurrence was seen after one year of follow-up. A similar surgical approach is indicated for patients with combined superficial and deep venous reflux, although the success rate will be less predictable. We observed a recurrence rate of 32% at one year. Our results, which are in accordance with the current literature show that reflux in superficial veins is a common finding in patients with venous leg ulcer, whereas isolated deep veins reflux is observed less frequently. These data have significant clinical implications, since superficial and perforator veins reflux can be treated by excision and ligation of the affected veins. Therefore our results show that a conservative approach of the treating physician to a chronic venous leg ulcer is no longer justifiable.

The treatment outcome of patients with venous leg ulcers is encouraging once the underlying vascular pathology has been identified and treated appropriately. Nevertheless there is a need for large prospective studies that use reproducible and standardized examinations and protocols to obtain a more accurate description of the anatomic and pathophysiological parameters of chronic venous insufficiency.