Varicose ulcer curability; let’s look at those legs

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Abstract
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Patients with leaking legs and painful ulcerous veins need exorbitant nursing care and antibiotics. They become dependent on frequent home visits; usual shoes cannot be worn and immobility, isolation and increased morbidity ensue. Leg Clinics may have improved psychosocial factors and motivation, but treatment with four-layer nurse-applied hand-bandage is not available in all centres. NICE (2013) identified the morbidity associated with varicose veins, and recommended that healed or persistent leg ulcers or associated skin changes such as pigmentation or eczema are seen by vascular services (Ref.1).

High-resolution colour duplex sonography is now being used to quantify the effect of localized compression (by inflays in compression hosiery), and the more rapid healing and prevention of long-term effects of skin thickening and damage (lymphostatic fibrosis/eczema) (Ref.2). Nevertheless the patient has to get the hosiery on, tolerate it, and then wear it.

Difficulties with the self-application of compression to the lower leg by the patient or carer are now being solved by the use of prescriptable, self-applied and adjustable Velcro-stabilized wrap appliances such as JustaCURES™ (Ref.3). As the cuff is wrapped, normal shoes can be worn and the ankle joint held for its vital role in pumping lymph upwards.

Feasibility and comparison studies are being undertaken on JustaCURES™ (Ref.4). Also cleaning/debridement solutions impregnated in wipes may prove as effective as washing. Both are certainly putting varicose ulcer treatment into the hands of patients and carers.

GPs can now radiate encouragement, enthusiasm and conviction of curability.

References
1. NICE Clinical guidance (July 2013): 168 The diagnosis and management of varicose veins
3. NICE (2013) recognized the morbidity associated with varicose veins, and recommended that healed or persistent leg ulcers or associated skin changes such as pigmentation or eczema are seen by vascular services (Ref.1).

Venous leg ulcers: The extent of the problem

NHS Choices (2014) estimate that 1 in 500 of the UK population are affected by varicose leg ulcers, and this rises to about 1 in 50 over 80 year olds with Posnett and Frankis (2008) estimating a prevalence of an open leg ulcer of about 200,000 (Ref.5). With good management, most heal within 3 months but some never resolve. Chronic ulcers are often painful, made worse by wound dressing. Reduced mobility, sleep loss, reduced productivity.

The treatment cost for the NHS has been estimated by Ashby in 2014 (Ref.6) as a mean annual cost of £179,30 per ulcer. Varicose ulcer treatment and compression bandaging cost £140.90 per patient. The Royal College of Nursing recommendations of 2006 advise that the most important treatment for uncomplicated venous ulcers is the application of high compression, with bandaging being applied at the highest pressure which is tolerated, which should be pressures of 40 mmHg if there are no contraindications, and the ankle brachial pressure index is over 0.8 (Ref.7).

For varicose ulcers: Compression alone is ineffective, but nothing is achieved without it

Advantage to General Practice of adjustable compression systems for treating venous leg ulcers

If the patient and/or carer could be provided with compression that they could apply themselves, patient-centred practice would be achievable. This is reported with the use of JustaCURES, a ‘bandage compression support’ with CE-mark since 2013, now marketed by MedUK, Hertford (Ref.3), is an adjustable wrap-around compression washable system of breathable inelastic fabric that can be applied over conventional wound dressings. Once this has been adjusted to fit the patient, it is put on over a leg liner, and known as the ‘4 Velcro system’. The ‘4 Velcro’ ensures that it is tightly fitted before the correct pressure using a guidance card. Adjustments will be needed as swelling resolves but this is the hands of the trained patient or carer. JustaCURES can easily be removed for washing or inspection of the ulcer. It can be used day and night, and allows use of usual shoes. This is highly significant for maintaining the pump action of calf muscle with free movement of the ankle, and is particularly advantageous for driving.

There are as yet no controlled studies comparing the effectiveness of JustaCURES to conventional bandaging with regard to ulcer healing, along with compliance, quality of life, cost and consistency of pressure. Initial patient comments have been very positive, some other patients have reported being able to work after successful treatment of long-standing ulceration (Ref.3).

Cost savings per patient

JustaCURES is available on the NHS Drug Tariff Feb 2015 at a cost of 59 stc/plied. Velcro compression bandaging for patient use based on an evaluation of 17 patients over a 6 month period by Bianchi et al (Ref.7) were

• Dressings: £753
• Bandages: £881
• Clinic time: £3,172

Figure 1 Ultrasound appearance of skin [Provided by Dr Jumphreys, Friedrich using Logic S7 Pro GE Healthcare]

What are Lymphoedema and Lymphostatic Fibrosis?

NICE Medtech innovation briefing 25 refers to the raised blood pressure in veins as being responsible for chronic changes in the skin, associated with varicose veins and ulcers. The underlying cause, as researched in considerable detail in Continental Europe, is likely to be due to congestion and accumulation of protein-rich lymphatic fluid in the skin of the lower leg. Factors which are known to lead to this are the decreased pumping action of flexion and extension of the ankle joint in walking, previous damage to veins, or standing or sitting for extended periods. If this continues without clearing the protein and the inflammatory fluid, fibrosis and sclerosis of the skin (in all layers) builds up. The skin is then thickened and harder, and much more likely to split and/or become infected (cellulitis) or eczematous.

NHS Choices do include softening of the skin and attempts at removal of the excess lymphedema by so-called manual therapies of decongestive therapies, by gently massaging subcutaneous tissue in the direction of lymphatic return. The evidence-base for these therapies is not ideal, but combined with compression hosiery, signs of the potentially serious fibrosis of legs (seen in extreme cases as “bottle-neck legs”, with the thin calves due to complete replacement by fibrous tissue) can be avoided.

Fibrosis is a dynamic process orchestrated by the immune system, or activated by inflammation or cell stress. Industry is now investing in research to find new anti-fibrotic therapies; fibroblast and perivascular cell phenotype and differentiation are regulated not only by cytokines but also by matrix composition and stiffness (Ref. 8). This supports the need for targeted compression and upward lymph clearance by movement at the ankle for avoidance of fibrosis in skin of legs.

How can varicose ulcers be prevented initially, treated correctly as soon as they appear and prevented from recurring?

Use of Ultrasound for assessing sites of lymphatic congestion in skin, as a quantitative tool for assessing the effect of therapy

The localized build-up in subcutaneous tissue can be seen using high-resolution ultrasound of the skin, using an 18 MHz linear transducer with ultrasonically measurements of its depth can be made (Fig.1).

Ultrasound investigations for skin have the advantage to the patient of being non-invasive and non-radiating. For the clinician, once the equipment is in place, the skin appearance can be assessed by moving the transducer over the skin as needed, and the resulting pictures stored or printed off. This provides a record both for reassessment at reproducible sites (such as over the first metatarsal head) and for confirmation of service.

Transducers producing a range of 10-15 MHz give a penetration of 2-3 cm below the skin surface which is ideal for the examination of lymphostatic fibrosis and lymphostatic fibrosis.

Areas of lymphatic congestion can be determined on skin by observation and palpation but the use of high-resolution duplex colour ultrasound allows quantification of areas of which may go on to fibroclerosis. Using a pattern cut depending on the extent of the localized build-up, polyurethane inlays can be inserted into appropriately sized and shaped pockets in flat-foot compression hosiery, over dressings as required (Fig.2 and 3). Noori et al. (2014) were able to show both quality of life improvements as well histological evidence of more rapid healing with this extra pressure at vulnerable sites (Ref.2).

For GPs to be aware of the occupational risks posed to nursing staff by carrying buckets of water (filling, lifting, bending), washing feet at floor level and applying bandages in the home or even in primary care settings where the patient cannot easily raise their legs

Objectives of the Presentation on Curability of Varicose Ulcers

1. To encourage GPs to look at legs, even when not asked or symptomatic
2. To make GPs aware of costs involved in treating chronic leg conditions especially ulcers
3. To remind GPs to refer symptomatic legs to vascular services for initial assessment
4. To assist GPs to talk knowledgeably about leg treatment to their practice nurses and patients
5. For GP involvement in commissioning evidence-based cost-efficient local nursing services
6. For GPs to be aware of the occupational risks posed to nursing staff by carrying buckets of water (filling, lifting, bending), washing feet at floor level and applying bandages in the home or even in primary care settings where the patient cannot easily raise their legs
7. To make GPs aware of costs involved in treating chronic leg conditions especially ulcers
8. To inform GPs about NICE advice on new prescribable devices for adjustable calf pressure for treating venous leg ulcers (and involve them in clinical trials for a better evidence-base)
9. To fascinate GPs about the science of lymph congestion in recurrent long-term conditions
10. To show GP and practices about curability and prevention of recurrence of varicose ulcers

Other training resources with grants from Lymphoedema Support Network

BMJ Learning 2011 Chronic oedema and lymphedema
Peter Mortimer and Graham Easton
Map of Medicine (evidence-based) care pathway for chronic oedema/lymphedema
Peter Mortimer and Vaughan Keeley 2015

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Figure 2 Compression hosiery with polyurethane inlay inserted into pocket for extra pressure at specific site determined by experienced physician using palpation and ultrasound (Mediven, Mediv)