The link between varicose veins and leg ulcers and how both can be cured

KEY WORDS
- Endovenous surgery
- Medicolegal cases
- National clinical guidelines
- Varicose veins
- Venous leg ulcers

This article highlights new clinical developments in the assessment and treatment of venous legs ulcers. It explains the link between varicose veins and leg ulcers and reiterates the importance of following national clinical guidelines when treating patients with lower leg problems. It warns doctors and nurses of the potential medicolegal ramifications if guidelines are being ignored.

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A revolution in the understanding of venous leg ulcers occurred in the early 1990s (Shami et al, 1993). This led to two major studies by Gohel et al, one which was published in 2007 and one published in 2018 that have revolutionised how venous leg ulcers should be investigated and treated (Gohel et al, 2007; 2018). Despite the fact these studies were UK based, the results have not changed the practice of investigating and treating venous leg ulcers in the UK in any substantial way. This is even more surprising as the National Institute for Health and Care Excellent (NICE) clinical guidelines changed in July 2013 outlining how these practices should change (NICE, 2013).

The failure of UK doctors and nurses to embrace the new understanding of venous leg ulcers is now starting to result in medicolegal action (Whiteley, 2018). Patients are understandably upset when they find out that they may not been offered proven, curative treatment with the majority (although not all) true venous ulcers responding to the appropriate venous surgery. It is therefore vital that all healthcare professionals keep up to date with the changes in the treatment of leg ulcers (Whiteley, 2018).

A REVIEW OF THE VENOUS SYSTEM

Veins take blood from the feet to the heart. When the patient is lying or the feet elevated, there is enough pressure in the venous blood emerging from the capillaries for this to occur. However, when the feet are below the heart such as when sitting or standing, blood needs to be pumped uphill against gravity. This requires both movements in the lower legs to push the blood upwards, and competent valves to stop the blood refluxing back down the vein when the movement stops.

Most venous diseases occur when valves stop working in one or more veins of the legs causing venous reflux (Whiteley, 2011).

Traditionally, UK doctors and nurses think of leg veins as being in one of two compartments, either deep or superficial. For decades it has been taught that reflux in the deep veins results in venous leg ulcers and reflux in the superficial veins results in varicose veins. Therefore, following this logic, the treatment for venous leg ulcers was thought to be compression, whereas the presence of varicose veins was thought to be only a cosmetic problem. Patients with varicose veins could have superficial vein surgery, but it wasn't medically necessary.

This all changed in the 1990s with the introduction of venous duplex ultrasonography. This combination of ultrasound and Doppler allows vascular technologists to see venous blood flowing in real time. By squeezing a calf in a standing patient, blood can be seen to flow up a vein. When the calf is released, blood should not flow back down the vein if the valves are working. However, if the valves are not working, the blood can be seen to reflux abnormally down the affected veins (Whiteley, 2011).

When patients with venous leg ulcers were examined using venous duplex ultrasonography, the majority of patients with venous leg ulcers actually had normal deep veins and only had reflux

Right venous leg ulcer due to hidden varicose veins; 12 weeks after endovenous laser of the great saphenous vein with no compression used

Right venous leg ulcer due to hidden varicose veins; Duplex showed only great saphenous veins reflux

in the superficial veins (Shami et al, 1993). Even more concerning, many of these patients with superficial venous reflux and leg ulcers did not even show varicose veins on the surface. Therefore, without a venous duplex ultrasound scan it was found to be impossible to tell which veins are refluxing.

This finding had significant ramifications in the understanding of venous leg ulcers.

ENDOVENOUS SURGERY

The first endovenous operation in the UK was performed in March 1999 (Fraser, 2000); these minimally invasive techniques are now replacing open stripping (NICE, 2013). Now superficial venous reflux can be cured with endovenous surgery under local anaesthetic, and it has become the NICE recommended first-line treatment for varicose veins (NICE, 2013). Although most vascular surgeons in the UK only treat the major truncal superficial veins (the great saphenous vein and the small saphenous vein), a new breed of venous specialists called "venous surgeons" or "phlebologists" is emerging who also are able to treat incompetent perforators using the TRans-Luminal Occlusion of Perforator (TRLOP) technique (Bacon et al, 2009), and embolise incompetent pelvic veins (Ratnam et al, 2008). All of these areas of reflux have been shown to be associated with both varicose veins (Rutherford et al, 2001; Whiteley et al, 2014) and venous leg ulceration (van Gent and Wittens, 2015; Dabbs et al, 2018).

As each of these points of venous reflux can only be identified reliably by venous duplex ultrasonography, and all can be treated with endovenous techniques, the consequences mentioned above are as follows:

- Most venous leg ulcers are curable by treating the superficial venous reflux with local anaesthetic endovenous surgery (which may include treating perforator veins and pelvic veins)
- Varicose veins, being caused by superficial venous reflux, are not "only cosmetic" and if left untreated can deteriorate to venous leg ulceration
- It is impossible to assess a leg for venous leg ulceration, varicose veins or even "hidden varicose veins" without a venous duplex ultrasound scan.

THE LINK BETWEEN VARICOSE VEINS AND HIDDEN VARICOSE VEINS AND VENOUS LEG ULCERS

When valves fail in the superficial veins, blood can reflux down them causing superficial venous reflux. If this reflux routes to the surface and surface veins dilate to act as "shock absorbers", these can be seen on the surface and are called varicose veins. However, in approximately half the patients with superficial venous reflux, the blood stays in the truncal veins impacting at the ankle and causing inflammation. In these patients, there are no obvious varicose veins and nothing is visible on the surface until the ankle starts to swell, discolour and eventually ulcerate. In 2011, the term "hidden varicose veins" was first published for this condition (Whiteley, 2011) as it is easier to understand than "superficial venous reflux".

It has been shown that patients with varicose veins have a 4.3% chance of deteriorating every year (Pannier and Rabe, 2015). This deterioration starts with varicose veins, which leads to swollen ankles, ankle discolouration and finally venous leg ulcers. Hence each year, almost 1 in 20 people with varicose veins or hidden varicose veins will deteriorate to the next level of deterioration. Therefore, no doctor or nurse should ever tell a patient that "varicose veins are only cosmetic" unless they have a venous duplex ultrasound scan to show there is no underlying truncal vein reflux, perforator vein reflux or pelvic vein reflux.

DEEP VEIN REFLUX AND OBSTRUCTION IN VENOUS LEG ULCERS

There are also patients with venous leg ulcers that are not related to superficial venous reflux. Patients who have had multiple deep vein thrombosis in the past may have scarred deep veins. This can result in deep vein reflux and/or deep vein obstruction. When this occurs and causes discolouration, ulceration and/or swelling, it is called post thrombotic syndrome. This is probably about 10%

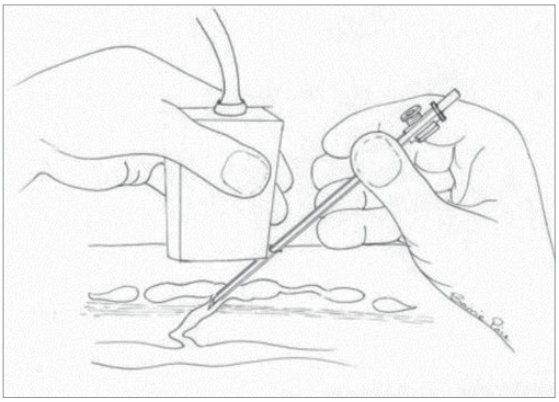
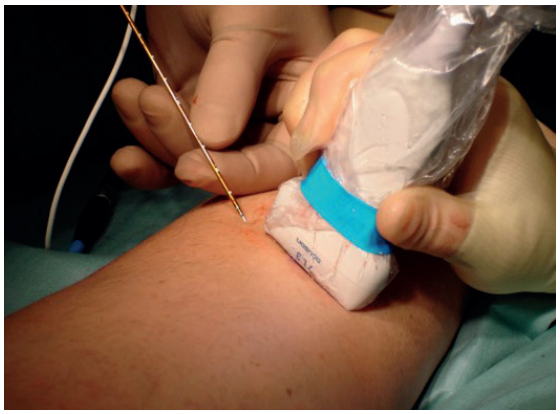


Diagram of a surgeon using TRans-Luminal Occlusion of Perforator (TRLOP) technique to close small perforating veins



TRLOP performed by the author using the original Radio Frequency Stylet (RFS) catheter

of the patients who have venous leg ulcers. In the past it was thought that only elevation and compression can help these patients. However, recent research has shown that in a great many patients, deep vein reflux is related to obstruction higher in the veins, and this can be treated successfully with venous stenting (Raju et al, 2010). Therefore, even deep vein causes of leg ulceration can now be treated in some cases.

It should be noted clearly that patients who have had only one episode of deep vein thrombosis in the past rarely go on to get post-thrombotic syndrome (Meissner et al, 1993). Therefore, a history of deep-vein thrombosis should not stop doctors or nurses to fully investigate these patients for the possibility of a cure.

VENOUS STASIS AND VENOUS LEG ULCERS

Venous stasis remains one of the major problems in venous leg ulceration. All of the new treatments that have been developed using endovenous ablation of superficial venous reflux, or deep vein stenting, rely on blood being pumped up the veins once the veins have been repaired. Therefore, if a patient is immobile or only has very poor mobility, it becomes irrelevant as to what the underlying cause of the venous leg ulcer is as treatment is not indicated, unless they will become mobile again in the future.

NATIONAL GUIDELINES AND THE MEDICOLEGAL POSITION OF INVESTIGATING AND TREATING VENOUS LEG ULCERS

Most nurses treating venous leg ulcers are familiar with NHS RightCare scenario: "Betty's story" (NHS England, 2017) and need to be aware of the NICE clinical guideline CG168: "Varicose veins: diagnosis and management", which was released in July 2013 (NICE, 2013). The inclusion of leg ulcers in this guideline (although the words are missing from the title) shows the close link between varicose veins and venous leg ulcers. The guideline states that anyone who has a venous leg ulcer (defined as a break in the skin for two weeks or more), even if it is healed, needs to be referred for venous duplex ultrasonography and assessment for endovenous surgery. In order to protect them medico-legally, nurses and GPs have to be able to demonstrate that referrals to their local vascular service have been made or attempted.

Doctors and nurses treating patients with lower limb conditions need to be aware that failure to follow the published guidance can result in patients suing both general practitioners and district nurses (Whiteley, 2018). In one documented legal case, nurses have had 70 contacts with a patient with lower leg ulcers but had not questioned why the doctors had failed to follow the NICE clinical guidelines (Whiteley, 2018).

If national guidelines are not enough, there are now two major randomised controlled studies that show the necessity of investigating and treating patients with venous leg ulcers with venous duplex ultrasonography and endovenous surgical techniques. Expert witnesses and lawyers will be well aware of these should legal cases arise.

The first, the ESCHAR study published in 2007 showed that when patients with venous leg ulcers were randomised to either venous surgery or compression bandaging alone, those that had venous surgery had a significantly lower risk of getting recurrent ulcers in the future (Gohel et al, 2007). More importantly, post-study analysis also showed that because the surgical waiting list was not taken into account and compression started immediately, the benefits in faster healing were somewhat hidden in this study.

This led to the EVRA study published in 2018 which showed that patients with venous leg ulcers who had endovenous surgery healed significantly faster than those treated with compression alone 56 days in the early interventions group versus 82 days in the compression and deferred intervention group (p=0.001) (Gohel et al, 2018).

CONCLUSIONS

The assessment and treatment of venous leg ulcers are now entering a new era. The old routine of visual assessment, Doppler assessment for ankle arterial pressure and then compression therapy need to be updated. This was first suggested by the studies in the early 1990s, but has now been embodied by the ESCHAR study, the EVRA study and also NICE national guidelines (Shami et al, 1993; Gohel et al, 2007; Gohel et al, 2018; NICE; 2013).

There is now no argument against the fact that patients who have suspected venous leg ulceration, even if healed, and who are mobile need to be referred for venous duplex ultrasonography and the assessment for endovenous surgery. Failure to do so not only means that patients are not been given what has been shown to be the correct treatment, but it also means that the healthcare professionals failing to refer the patients are breaking NICE quality standards QS 67 (NICE, 2014) and it is likely that if such guidelines continue to be ignored then medicolegal consequences may well follow (Whiteley, 2018). WUK

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The Leg Club Foundation now works in partnership with Professor Whiteley, founder of The College of Phlebology, aiming to provide education, evidence-based treatment and care to improve the quality of life of individuals with chronic lower limb conditions. The Leg Club Foundation embraces endovenous surgery as a cost-effective surgical cure of ulcers, complementing the proven benefits of the Leg Clubs, which tackle social isolation through education and holistic care. https://www.collegeofphlebology.com/

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