Leading article

New evidence on treatments for varicose veins

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The past 15 years have seen revolutionary developments in the treatment of varicose veins, as new methods have been introduced and adopted widely. Historically, thorough surgery (typically saphenofemoral or saphenopopliteal ligation, with 'stripping' of the incompetent truncal vein and phlebectomies) was the standard, and remains so, as the comparator for any new approach. Endothermal techniques have become commonly used as alternatives to ligation and stripping; these ablate the great or small saphenous vein by passage of a radiofrequency or laser catheter up the vein under duplex ultrasound guidance. Conventional sclerotherapy (using liquid sclerosant) continues to be used for selected veins of limited extent, but ultrasound-guided foam sclerotherapy has become a popular method of treatment for more extensive varicose veins. Still newer methods, such as techniques that combine sclerotherapy with mechanical disruption of the vein endothelium, injection of glue and steam ablation, are also emerging.

Endothermal ablation and foam sclerotherapy were initially adopted with patchy and rather inadequate evidence, driven by a desire for less invasive methods, enthusiasm to innovate, and financial motives in private practice (because they offer the potential for 'office-based' procedures). In recent times, the evidence base has increased significantly and this issue of *BJS* contains the reports of three important trials and a major review with cost-effectiveness modelling of varicose vein treatments[1–4]. The full results of another substantial UK trial (the CLASS trial) will also be published before long (J. Brittenden *et al.*, unpublished results). All these new data follow hard on the heels of influential guidance, published by the National Institute for Health and Care Excellence (NICE)[5] in the UK, which has recommended a sequential approach to choosing the treatment for any patient with varicose veins. It ranks endothermal ablation as the method of first choice, followed by foam sclerotherapy ('if endothermal ablation is unsuitable') and surgery as the third option ('if foam sclerotherapy is unsuitable'). These recommendations have been the subject of considerable debate and it is worth examining them in the context of the most recent studies, as part of a general overview of our current knowledge.

The recommendations of the NICE guidance[5] were based on a literature review conducted in 2012. This provided no convincing evidence of differences in the clinical effectiveness of either endothermal ablation or foam sclerotherapy compared with surgery, but a slight advantage of endothermal ablation over foam. Cost-effectiveness was therefore an important influence, and cost modelling concluded that endothermal treatment had some advantage over both foam and surgery. These were the considerations on which the recommendations were based. The NICE guidance identified areas of uncertainty that would benefit from further research – in particular, whether different treatments might be appropriate for varicose veins of different stages of clinical severity and whether adjunctive treatment is better given at the same time as endothermal ablation, or at a later date if required.

The new studies provide some good comparative data and also information about longer-term follow-up, but they have not produced consistent or compelling findings that one treatment is clinically much better than another. The thorough systematic review and network meta-analysis by Carroll and colleagues[1] in this issue of *BJS* included nearly 4000 patients from 34 randomized clinical trials. It concluded that there were negligible differences in clinical and quality-of-life outcomes between endothermal ablation, foam sclerotherapy and surgery. It exposed differences that are well recognized, such as more discomfort in the immediate period after surgery, but no important differences in outcomes in the medium or long term. Based on clinical severity scoring, foam sclerotherapy seemed to be the most effective intervention.

Long-term effectiveness is a fundamental aim of all treatments for varicose veins. The propensity for recurrence is high – many people simply have a tendency to form more varicose veins even after thorough treatment. For patients with complications from varicose veins the aim is to minimize the chance of repeated episodes of bleeding, troublesome phlebitis or ulceration, or to prevent progression of skin damage (from eczema to lipodermatosclerosis to ulceration). People with uncomplicated but symptomatic varicose veins can expect good symptom relief

from treatment[6]. However, we do not know the extent to which treatment provides prophylaxis against future complications, because it is not currently possible to predict which of the many people with varicose veins will develop skin damage or other problems[5].

The study by Darvall and co-workers[2] in this issue of *BJS* reports on long-term outcomes in a cohort of 285 patients a median of 6 years after foam sclerotherapy. They found persistent and significant improvements in varicose vein symptom scores and high satisfaction rates, although many quality-of-life metrics were unchanged following treatment. This study did not attempt any objective assessment of ablation rates of truncal veins in the long term, which raises the issue of how 'success' of treatment is best determined. The review by Carroll *et al.*[1] documents a surprising disconnect between clinical outcomes and the successful ablation of truncal veins. Truncal vein ablation is generally regarded as the holy grail of success in treating varicose veins, on the basis that the high pressure in incompetent trunks (usually the great or small saphenous) is the root cause of the high venous pressure, varicosities, symptoms and complications. There is an assumption that the risk of recurrence is increased if the main incompetent trunk is not completely ablated, with the possible need for further treatment. Darvall and colleagues[2] reported a 15 per cent retreatment rate at 5 years, but we still need more information about recurrence rates in the long term and about the need for retreatment.

The initial intent of treatment in terms of whether or not to get rid of all visible varicose veins is an important consideration. If the aim is solely to relieve symptoms, endothermal ablation alone may suffice; however, if the aim is to get rid of all varicose veins, either concomitant or later surgical phlebectomies, or foam sclerotherapy, may be required. The same applies to foam sclerotherapy, with regard to the frequency of repeat treatments. The extent to which these adjunctive treatments of varicosities is done varies substantially. In the newly published studies, further treatment after foam sclerotherapy was done in just 21 per cent of patients by Darvall *et al.*[2], but in 38 per cent in CLASS (J. Brittenden *et al.*, unpublished results). After endothermal ablation the variation was more striking still – 31 per cent in CLASS but 79 per cent in the study by El-Sheika and colleagues[3].

El-Sheikha and co-workers' report[3] sheds light on the question of concomitant or later treatment of varicose veins by phlebectomies, in association with laser ablation of the great saphenous vein (just 1 visit for treatment or more than 1, which is logistically important). Follow-up of randomized patients after these treatment strategies showed greater improvement in the early months after concomitant phlebectomies, but no differences in outcomes between the two groups after 5 years. Both groups maintained significant improvements in quality of life, although 20 per cent of patients in each group had recurrence of varicose veins.

The intent of treatment (truncal vein ablation alone or getting rid of all varicose veins as well), its setting (clinic room or operating suite) and the strategy (single session or repeated visits) are all factors in the cost-effectiveness of the different methods, which must be a major influence on their use, in the absence of convincing evidence that one method is clinically much better than another. Carroll and colleagues[1] exposed other important influences, in particular the effect of the time horizon used for cost modelling. If this is short, postoperative pain has a negative effect for surgery. If the time horizon is longer, the incidence of recurrence has an increasing effect. Carroll *et al.* found that endothermal ablation (by laser or radiofrequency) costs more than surgery, for a minimal difference in quality-adjusted life-years. They suggested that foam sclerotherapy may well offer the most cost-effective alternative to surgery, because its higher recurrence rate is offset by substantially lower treatment costs. This contrasts with the conclusions of the NICE guideline[5], which prioritized endothermal ablation as first treatment option, based largely on a different calculation of cost-effectiveness.

All the studies concur in showing that complications are rare following any of the treatment methods, but with a suggestion that complication rates may be marginally lower after endothermal ablation.

Despite all these new publications, there is no firm evidence that one method of treating varicose veins is universally the best. To an extent, the trials are blunt instruments in choosing the right treatment for each patient. Vascular specialists will continue to make judgements based on clinical factors that have not been the subject of rigorous assessment. For example, foam sclerotherapy is often chosen for patients with recurrent varicose veins whereas surgery may be best for patients with big, extensive bilateral veins. The NICE clinical guideline[5] has made a bold attempt to steer practice, based on now arguable evidence, but it has helped to focus the debate and to identify important research questions. Many of the uncertainties are likely to persist for the foreseeable future and to be compounded by the introduction of yet more new methods, such as steam ablation – the subject of a randomized trial[4] in this 'venous issue' of *BJS*.

Disclosure

The author declares no conflict of interest.

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