

Endovenous therapies of lower extremity varicosities: A meta-analysis

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Background: Minimally invasive techniques such as endovenous laser therapy, radiofrequency ablation, and ultrasound-guided foam sclerotherapy are widely used in the treatment of lower extremity varicosities. These therapies have not yet been compared with surgical ligation and stripping in large randomized clinical trials.

Methods: A systematic review of Medline, Cochrane Library, and Cinahl was performed to identify studies on the effectiveness of the four therapies up to February 2007. All clinical studies (open, noncomparative, and randomized clinical trials) that used ultrasound examination as an outcome measure were included. Because observational and randomized clinical trial data were included, both the Meta-analysis Of Observational Studies in Epidemiology (MOOSE) and Quality Of Reporting Of Meta-analyses (QUORUM) guidelines were consulted. A random effects meta-analysis was performed, and subgroup analysis and meta-regression were done to explore sources of between-study variation.

Results: Of the 119 retrieved studies, 64 (53.8%) were eligible and assessed 12,320 limbs. Average follow-up was 32.2 months. After 3 years, the estimated pooled success rates (with 95% confidence intervals [CI]) for stripping, foam sclerotherapy, radiofrequency ablation, and laser therapy were about 78% (70%-84%), 77% (69%-84%), 84% (75%-90%), and 94% (87%-98%), respectively. After adjusting for follow-up, foam therapy and radiofrequency ablation were as effective as surgical stripping (adjusted odds ratio [AOR], 0.12 [95% CI, -0.61 to 0.85] and 0.43 [95% CI, -0.19 to 1.04], respectively). Endovenous laser therapy was significantly more effective compared with stripping (AOR, 1.13; 95% CI, 0.40-1.87), foam therapy (AOR, 1.02; 95% CI, 0.28-1.75), and radiofrequency ablation (AOR, 0.71; 95% CI, 0.15-1.27).

Conclusion: In the absence of large, comparative randomized clinical trials, the minimally invasive techniques appear to be at least as effective as surgery in the treatment of lower extremity varicose veins. (J Vasc Surg 2009;49:230-9.)

Lower-extremity venous insufficiency is a common medical condition and occurs in about 15% of men and 35% of women.¹⁻³ The effect of venous insufficiency on patients' health-related quality of life (HRQOL) is substantial and comparable with other common chronic diseases such as arthritis, diabetes, and cardiovascular disease.⁴ In 1995 the overall cost associated with deep or superficial venous insufficiency, or both, was about 2.5% of the total health care budget in France and Belgium.⁵

The treatment of varicose veins alleviates symptoms and, hopefully, reduces the complication rate of venous insufficiency. The traditional gold standard in the treatment of varicosity of great saphenous veins (GSVs) is a high ligation at the saphenofemoral junction (SFJ), followed by stripping; conventional treatment of small saphenous veins

(SSVs) is ligation at the saphenopopliteal junction (SPJ), often without stripping.

Surgery of varicose veins is usually performed under general or epidural anesthesia and may be associated with neurologic damage (about 7% in short and up to 40% in long stripping of GSVs),^{6,7} scars, and postoperative pain. Despite the relatively high incidence, the neurologic damage has often little resultant morbidity. Although surgery is highly effective in the short term, the 5-year recurrence rates are approximately 30% for GSVs and 50% for SSVs, which may be due to neovascularization.^{8,9} Only <10% of these recurrences are clinically relevant.

To improve effectiveness and patients' HRQOL and to reduce postoperative downtime, complications, and costs, new minimally invasive techniques such as ultrasound-guided foam sclerotherapy (UGFS),¹⁰ radiofrequency ablation (RFA, VNUS Closure, VNUS Medical Technologies, San Jose, Calif),¹¹ and endovenous laser ablation (EVLA)¹² are now widely used in the treatment of lower extremity varicosities.

Although case series and comparative studies suggest lower recurrence rates of these minimally invasive interventions compared with surgical stripping, no large, long-term, comparative randomized controlled trials (RCTs)

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