ASK THE EXPERTS

The Next Big Thing: What Do We Need in Superficial Vein Care?

Experts discuss the challenges in managing patients with venous disease, including venous ulcers and treatment of the great saphenous vein, as well as how to improve the quality of life of these patients.

Sergio Gianesini, MD, PhD
University of Ferrara
Ferrara, Italy
Uniformed Services University
Bethesda, Maryland
UCES University
Buenos Aires, Argentina
+39 3498012304
sergiogianesini@gmail.com
Disclosures: None.

We need to keep apples with apples and oranges with oranges! In brainstorming what we need next in superficial care, I focused on what we have not accomplished during the past few years of venous therapy. In the modern venous literature, many investigations have compared the performance of different therapeutic techniques.[1,2] At the same time, we still have very few studies assessing homogenous reflux patterns, which significantly decreases robustness of the same scientific comparison.

One of the next big things we need is the ability to set specific guidelines in study protocols, including fundamental data representing a potential bias if it is not reported. For example, in 45% of great saphenous vein (GSV) trunk reflux detections, the saphenofemoral terminal valve is competent.[3] An incompetent femoral valve above an incompetent terminal valve increases the risk of postoperative reflux recurrence in the saphenofemoral junction by almost fivefold (odds ratio, 4.8; 95% confidence interval, 1.8–12.6; $P < .003$).[4]

A significant number of patients who present with incompetent tributaries along the leg and a GSV reflux require further tributary treatment after GSV reflux suppression, pointing to the fundamental hemodynamic role of the same incompetent tributaries.[5]

Thus, it becomes evident that all studies comparing different treatment techniques but, for example, do not report femoral valve and terminal valve competence have a serious risk of being biased, if also considered in terms of an incompetent tributaries assessment and their eventual staged treatment.

The effectiveness of one treatment technique compared to another can be significantly influenced by the hemodynamics of whether a system is protected by a competent femoral or terminal valve rather than overloaded by a still-present incompetent tributary along the leg.

To move forward in our evaluation of treatment options, the first thing we need to do is take a step back and standardize the way we assess and report the treated reflux patterns. By doing this, it will finally be possible to observe meaningful comparisons among the same "fruits" of our postoperative outcomes: apples with apples and oranges with oranges!

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Ellen D. Dillavou, MD, FACS
Associate Professor
Division of Vascular Surgery
Duke University Medical Center
Duke Regional Hospital
Durham, North Carolina
ellen.dillavou@duke.edu
Disclosures: Consultant to BTG International and Vascular Insights; President of the IAC Vein Center Accreditation Board.

Superficial vein care has seen tremendous changes in the past 2 decades with availability, better methods of saphenous ablation/closure, and dramatic improvements in ultrasound resolution, as well as better, safer means of sclerotherapy. However, despite these advances, we are still frustrated with stubborn venous ulcers that refuse to heal or heal and immediately recur. The Society for Vascular Surgery and American Venous Forum have crafted guidelines to create standardized protocols for venous ulcer care,[1] but even with a blueprint from leaders in the field, we have many patients who continue to suffer.

Healing venous ulcers is difficult; tracking their progress and reasons for recurrence is even harder. There is still a great deal of debate among experts as to the best strategies for ulcer healing and recurrence. Dr. Lawrence's work demonstrating the differences in healing rates for various vein ablations[2] should be the model for future work as we strive to determine the value of interventions for clinical, etiology, anatomic, and pathophysiology of C4 and C5 patients, the best strength of compression for C5 patients, and at what arterial insufficiency level should be considered. The American Venous Forum, as well as other national wound healing organizations, should take the lead on this, organizing data repositories to answer difficult questions and continue to provide guidelines.

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Thomas F. O'Donnell, Jr, MD
Senior Surgeon
Tufts Medical Center
Benjamin Andrews Emeritus Professor of Surgery
Tufts University School of Medicine
Boston, Massachusetts
Disclosures: Consultant to Amsel Medical Corporation.

To define something new in the treatment of superficial venous disease, we must start by focusing on an improvement of the oldest techniques for varicosities. Although treatment of GSV incompetence has been converted to a totally noninvasive approach with thermal and nonthermal ablation techniques, treatment of the tributary veins and associated varicosities still use centuries-old techniques. The Arabic surgeon Albucasis, of Cordoba, Andalusia (930–1313 AD), was one of the first to dissect out and remove varicosities with specialized instruments, which he described in his 30-volume textbook of surgery.[1] A student of ancient medical writings, Albucasis based his approach on the writings of Hippocrates. Although refinements in instruments and techniques have occurred over 20 centuries, the principle of open surgery for varicosities remains the same. Similarly, the first documented use of sclerotherapy was many centuries later in 1682 by D. Zollikofer of St. Gallen, Switzerland, who injected acid into a vein to induce a thrombus.[2]

Patients undergo treatment for varicose veins because they desire to have their varicosities disappear and symptoms relieved, but ablation of the GSV alone does not usually eliminate all varicosities. Currently, the options for treatment of varicosities are either a surgical approach, stab phlebectomy (eg, ambulatory phlebectomy, miniphlebectomy), chemical ablation, or sclerotherapy. Hobb's classic randomized controlled trial showed that stab phlebectomy had better results than sclerotherapy and the results were dependent on vein diameter.[3] A subsequent randomized controlled trial by DeRoos et al[4] demonstrated that stab phlebectomy was associated with a much lower 1-year recurrence rate than sclerotherapy. However, stab phlebectomy can be associated with hematoma formation and occasionally with cutaneous nerve injury, even if done through mini incisions. In addition, short-term skin color changes, infection, pain, and diminutive red spider veins may occur.

Transilluminated powered phlebectomy has been described as a "minimally invasive method for totally removing varicose vein removal and employs three technologies: tumescent anesthesia, transillumination, and a powered endoscopic tissue dissector." Most frequently performed under general or regional anesthesia, this technique is most applicable with large extensive varicosities.[5] Hemosiderin staining (3.7%), cellulitis (1.9%), and hypertrophic scarring (0.5%) were reported in a large retrospective series of 547 patients.

Sclerotherapy is generally reserved for smaller-diameter veins and may frequently require a repeat session. If intravascular thrombus is not adequately drained by micro-

thrombectomy, cosmetically displeasing pigmentation can occur. Medical glue could be used, but the cosmetic consequences of a firm permanent linear structure under the skin is less desirable. A less invasive approach to tributaries and associated varicosities is needed.

Existing minimally invasive techniques have been applied to tributaries and varicosities, but thermal techniques are limited to straight vessels of a larger caliber. Moreover, if the varicosity is adhered to the skin and cannot be separated by tumescent fluid, thermal methods predispose the area to burns. Although laser exerts its thermal effect at the tip, radiofrequency devices require a 3-cm length at a minimum. Proprietary foam can be used in winding tributaries but carries with it the possible side effect of pigmentation. One new approach might be to occlude or ablate the tributary and varicosities through a percutaneous technique by clipping at both ends of the tributary, which has been described in animal studies.[6] Regardless, some improvements on 20-century-old techniques should be considered.

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Michael Tal, MD, MBA
Director of Interventional Radiology
Assuta Hospital
Tel Aviv, Israel
Disclosures: Co-founder and stock owner of Vascular Insights; inventor of Clarivein ablation device.

First and foremost, I started thinking of the common problems our venous patients have and the gaps that can be filled. I thought about the various new and not-as-new technologies and the issues and problems associated with these therapies.

Initially, I considered discussing the problems in the current treatment of telangiectasia and reticular veins. The cosmetic results of the currently available treatment options are absolutely not satisfactory. However, as I started researching this, I suddenly realized a much larger problem exists: venous ulcers. Venous ulcers are common, affecting between 1% and 2% of the world's population. In the United States, an estimated 500,000 people suffer from venous ulcers.[1]

The biggest gap I see in venous disease management is the treatment gap. Only a small fraction of patients with venous ulcers are treated with image-guided endovascular therapies that can help heal, decrease recurrence, and improve quality of life.[2] Patients with venous ulcers who receive treatment with the various available technologies usually improve dramatically. However, a minority of venous ulcer patients are seen by vein specialists. Most patients with venous ulcers are never referred for image-guided invasive treatments. They are treated in wound centers for many years, getting symptomatic relief, at best, by mostly futile compression treatments, leg elevation, occasional debridement, and various wound dressings. The root cause of the ulcer in most patients is never addressed. Many of the ulcer patients are from lower socioeconomic classes, who don't have access to private care and knowledge of research for the various treatment options. Oftentimes, the only health care provider they see are the wonderful nurses who work in wound centers and want only what's best for their patients. In addition, many venous ulcer patients are treated by their family practitioners. They are also unaware of the benefits of aggressive image-guided treatments for venous ulcers. In fact, if you google "venous ulcer treatment," compression therapy is practically the only treatment modality discussed. This was true and expected 25 years ago, but it should not be true today. With Doppler ultrasound, the pathologic veins (incompetent or obstructive) causing the ulcer can be identified and treated. The results are often dramatic, transforming the lives of these patients by making a positive impact on their quality of life. Vein specialists that treat ulcer patients have seen cases of dramatic improvements and rapid ulcer healing.

Although the identification of the problem may seem simple, that is bridging the knowledge and referral gap, the solution is more difficult. This is the largest challenge in venous care. However, it can be overcome with focused campaigns of all sorts (eg, local, national, global). These campaigns should be directed at the patients, family practitioners, and of course, at the gatekeepers in the wound centers. This is best done on a local basis. Physicians capable and interested in treating these complicated ulcer patients need to directly address those wound care centers and those patients. The various societies need to provide support, structure this approach, and organize the effort.[3]

By bridging the knowledge gap, it will be possible to allow the millions of venous ulcer sufferers to get the treatment they need. ■

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