Current Trends in Venous Stenting

Stenting expert Gerard O'Sullivan, MD, shares his thoughts on practice preferences and what's in store for the future of this treatment strategy.

GERARD O'SULLIVAN, MD

When and why do you place a venous stent?

Experience has shown that veins behave differently than arteries. The elastic recoil is much higher, and they are low-pressure systems so there is no vis-a-tergo to push blood through stenoses. Although the patency after iliac arterial angioplasty is close to but not quite as good as that for iliac arterial stenting, patency after angioplasty of iliac veins is poor. Virtually all patients who present with acute or chronic iliofemoral disease will therefore require a stent.

What is your imaging preference to identify venous disease?

If I had ready access to good-quality magnetic resonance venography (MRV) I would use it; however, most of the MRVs I am sent for review are woeful. Instead, I use indirect computed tomographic venography (CTV; essentially a contrast-enhanced CT) for acute venous problems, and direct CTV (needle into the ipsilateral foot, compression stockings to drive blood deep, bolus chasing heading north) for chronic venous issues.

Ultrasound is essential for identifying access points, as well as synechiae in the common femoral vein, but it is simply inadequate for proper identification of intrapelvic and intra-abdominal pathology. IVUS is the most accurate method of assessing stent deployment. Cone-beam CT is useful after stent placement if IVUS in unavailable. I am fortunate in Galway to have access to them all.

In which patient demographics do you see the most problems with rethrombosis?

Regardless of age, patients with poor inflow from the thigh are the most troublesome with rethrombosis. I work in a tertiary cancer center, and one would have assumed that these patients, with their comorbidities, would have a high rethrombosis rate, but they actually don't.[1] It is the people with severely scarred common femoral veins and damaged inflows who do poorly. An arteriovenous fistula should especially be considered in this subgroup.

Do you see more venous obstruction patients being treated nowadays because of the availability of venous stents in Europe? Has your patient volume increased with the approval of venous stents?

To be honest, my volume and those of other practitioners in this area is increasing because patients' and physicians' level of awareness is increasing. I do two or three deep venous cases per week now and almost always need a stent. We are fortunate now to have four venous-indicated stents: (in order of market release) Cook Medical's Zilver Vena (2011); Optimed's sinus-Venous (2012); Veniti's Vici (2013); and most recently, Boston Scientific Corporation received CE Mark approval for the original Wallstent to have a venous indication.

Do you think there are adequate opportunities for training and educating physicians on venous stenting? Do you think this has an impact on the uptake of venous stents (either negatively or positively)?

Certainly, there is a thirst for knowledge in this area! At the big meetings (VEITH/SIR/CIRSE/LINC), the venous component has increased dramatically over the past 5 years. The number of venous-only meetings (eg, Venous Symposium, IVC) is also growing. I think with the combination of the ATTRACT trial's results and US Food and Drug Association approval of venous stents (Cook Zilver Vena and Veniti Vici are currently being studied in US trials), the level of interest will ramp up significantly. So, there will be a greater need for simulators and other education.

Where are we still lagging to fully capture this market? Are there certain patient demographics that are more difficult to treat?

I think the major issue is that currently, patients are seen by physicians who do not have an intervention-based primary focus. Most physicians still simply anticoagulate and prescribe compression stockings. If you look at the numbers, this is a massively undertreated population. Let's say there are 300,000 new deep vein thromboses per year in the United States (incidence: 1/1,000)—about one-third of these will be iliofemoral. The rate of recanalization is approximately one-third with anticoagulation. So each year, about 66,000 new patients have a functional iliac vein occlusion. The vast majority of these would benefit from iliac venous stent placement, and only around 500 to 1,000 patients per year are so treated. So, there is a huge population out there. When patients are made more aware of their options, and when conservative physicians are convinced by ATTRACT of the need to remove thrombus in acute deep vein thrombosis, then the volume of venous stent procedures will grow inexorably.

What are the advantages of the currently available technologies?

Wallstents have been the mainstay technology with the largest pool of experience and longest follow-up of any stent. It is a stent that has stood the test of time, and others will have to match up to it. Nonetheless, it does have some idiosyncracies with which younger endovascular specialists are less comfortable, such as a significant degree of foreshortening (30% minimum), a tendency to straighten over time, and lack of vessel conformability. But the patency, if appropriately used, is hard to beat.

With the newer venous stent technologies, there is less foreshortening, better vessel conformability, and more precise placement. End-to-end consistent anticompressibility is the ideal. Balloon predilatation is much more important with the newer stents, and all stents need to be dilated to their nominal diameter after stent insertion.

What are the gaps, and what do those gaps mean for patient outcomes? Do you see different outcomes depending on the stent used?

The ideal venous stent has yet to be found. Compare the situation to that of the infancy of interventional cardiology in say, 1988. How many stents from that era are still in use? Very few! I think we have a great deal to learn, and there are many questions to be answered. For instance, there probably will eventually be a specific stent for treating May-Thurner syndrome. Stents will almost certainly be made physically longer. How about 3D formatting? The place of heparin or drug-coated stents has not been identified. Should we be using covered stents? Do the sizes recommended by the venous stent pioneers (eg, Drs. Seshadri Raju, Peter Neglén, Anthony Comerota, Michael Dake, Olivier Hartung, etc) apply for the newer stents? Who should get an arteriovenous fistula? Who should get a femoral endovenectomy?

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In terms of different outcomes for stents used, there is some interesting work from Maastricht concerning inferior vena cava confluence stenting, and specifically the use of balloon-expandable stents at the inverted "Y" point with demonstrably better results—so this is exciting.

Do you know of anything in the works for creating consistent venous stenting guidelines, either from societies or other physician groups? If no, how can we get there?

A multidisciplinary working group in Europe has been set up to attack this very problem. We need consistent guidelines for preoperative imaging, follow-up, anticoagulation duration and type, stent diameter, length into the inferior vena cava, and lower end in relation to the internal iliac vein/external iliac vein, etc.

I do think regardless of whether the ATTRACT trial results are positive or negative (I really do hope they are positive to confirm the evidence of our own eyes in daily practice), the place for venous stenting in chronic disease has been well proven—although no doubt a multicenter, randomized, controlled trial would be helpful here, too. I think the future for deep venous work is very bright, and I see limitless opportunities for research and innovation. ■

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1. O'Sullivan GJ, Waldron D, Mannion E, et al. Thrombolysis and iliofemoral vein stent placement in cancer patients with lower extremity swelling attributed to lymphedema. J Vasc Interv Radiol. 2015;26:39-45.