Matching DVT Patients With Procedures: Endovascular, Surgical, and Hybrid Options

Dr. Anthony J. Comerota discusses experiences treating patients who have challenging venous occlusions and the therapies that are currently available.

How would you summarize the progress that has been made in surgical and hybrid techniques for treating patients with postthrombotic occlusions?

I would summarize it as significant progress that can be applied to a small number of patients. Most internists and family physicians believe that once the patient has chronic changes intraluminally as a result of deep vein thrombosis (DVT), nothing more can be done. But, we know that when postthrombotic fibrosis occurs in proximal veins, luminal continuity can be restored to large central veins, specific to the lower extremity. This would include the common femoral vein to the vena cava.

What characteristics make a case a better fit for surgical or hybrid techniques as opposed to other management strategies?

The cases that are best suited for endovascular means are those that involve only the external iliac veins and the common iliac veins, with or without vena caval involvement. If all of the fibrotic occlusion or obstruction occurs above the inguinal ligament, these patients can be treated purely with percutaneous endovenous balloon dilation and stenting. Patients who have fibrotic occlusion of the common femoral vein are the best cases for surgical or the combined surgical and luminal venous recanalization techniques. If one were to manage these patients with only endovenous techniques, there would be a high risk of obliterating the drainage from the profunda femoris veins. This would reduce the benefits of recanalizing the iliac venous system and may actually make their clinical condition worse.

What are some of the particular challenges encountered in this population?

The challenges are numerous, and one specific challenge is how to preinterventionally or preoperatively predict which patients will respond to treatment. Certainly, for patients who have an open common femoral vein or have a named venous occlusion, we know that they will improve if we restore unobstructive venous drainage from the inguinal ligament to the vena cava. However, for many patients, on preoperative venography, the contrast doesn't fill any named vein, and then we're left to speculate whether or how much patients will improve. For example, if the profunda and common femoral veins are not visualized, will the patient benefit? As it turns out, experience has shown that patients whose central veins we've been able to open and keep open have improved.

Another challenge is determining the proper pharmacotherapy at the time of intervention and following intervention. Questions in this regard include whether patients should take combined platelet inhibition, how long to keep them on anticoagulation, and how intensely they should be anticoagulated at the time of the procedure.

What do these patients require in terms of postprocedure medication and monitoring?

Many of our patients have had recurrent thrombosis, and as such, are being treated with anticoagulation and will remain anticoagulated for an indefinite period of time. In addition to warfarin, we will add aspirin and clopidogrel to the periprocedural pharmacotherapy. I will keep the patients on aspirin indefinitely and will discontinue

clopidogrel at approximately 8 weeks because we believe that endothelialization of the struts of the stent will be complete by 8 weeks; therefore, there won't be any direct exposure between the metal of the stent and blood or luminal contents. Thus, the stent should not be stimulating platelet aggregation after 8 weeks.

Which patients should not be treated via surgical or hybrid procedures?

We advance a guidewire from the infrainguinal venous system into the patent vena cava preoperatively before taking patients to the operating room and performing the hybrid technique. So far, when we have been able to pass a guidewire from below the inguinal ligament into the vena cava, we have been able to recanalize the occluded iliofemoral/vena caval segments.

In one of the patients we operated on early in our experience, we did not attempt preoperative passage of the guidewire. Due to other hardware in her pelvis, we were unable to pass a guidewire from the infrainguinal veins to her vena cava. This patient required a cross-pelvic bypass in addition to a common femoral vein endophlebectomy. There was persistent iliac occlusion due to compression by orthopedic hardware. That case taught us a valuable lesson: we should establish whether we can actually achieve continuity at least by guidewire passage before we take the patient to the operating room.

Specifically, if the common femoral vein looks good below the saphenofemoral junction, a combined procedure is not required, as the stent can be landed well above the profunda femoris vein. Therefore, the procedure can be performed percutaneously.

How do you measure the success of a case and the overall effectiveness of a particular technique?

We have quality-of-life questionnaires that patients complete before and after the procedure. We establish their venous clinical severity score and their Villalta score before and after the procedure. Therefore, we have objective measures of quality-of-life and venous disease scores.

Can you comment on the relative cost-effectiveness of these techniques?

I'm sorry, but I can't. I am not an expert in analyzing cost-effectiveness. Many of the long-term costs involved and the effectiveness of the procedures relate to patients' ability to generate an income. A number of patients who we have treated were not able to hold a full-time job. Postoperatively, they were able to return to work full-time unencumbered. That element is usually not considered in the equation of medical therapy cost-effectiveness. If you were to include that into a calculation of the cost per quality life year, I am certain that it would translate into a reasonably good cost-effectiveness.

To what degree must you use devices designed or approved for other indications?

In the United States, there is no stent approved for use in the venous system. Studies are underway to evaluate venous stents, but I anticipate that it will be several years yet before the FDA receives data supporting their approval. Presently, we are using biliary stents and arterial stents.

What kind of device characteristics would you like to see added to your armamentarium? Is there anything you are looking for or excited about?

Of course, an approved venous stent. We would love to see it be accurately deployable, which means that when we put the stent in and it assumes its projected diameter, it does not foreshorten or change shape if balloon dilation is performed. It would also need to have resistance to external compression, which is different from radial strength.

How would you describe your hospital's decision-making and communication process when it comes to selecting the ideal therapy for patients with chronic venous obstructive disease?

The decision making generally centers around myself and one of my interventional radiology colleagues. We work as a team in approaching these patients, and we are fortunate to have the support of our hospital and health system, so that when we make a decision to move ahead, we can do so unencumbered.

How can separate departments such as emergency, radiology, and vascular surgery, work more closely in treating these patients and ensure that they are evaluated for every available option?

This is important, especially as it relates to the prevention of postthrombotic obstruction. If we can treat patients with iliofemoral DVT with the strategy of thrombus removal (and the overwhelming majority will be treated with catheter-directed or catheter-based techniques), the patency of the iliofemoral venous system will be restored. If there is an underlying lesion, it will be stented. It is much easier to perform these techniques when the patient presents with an acute iliofemoral DVT than when they return months or years later with chronic postthrombotic fibrotic occlusion.

Identifying patients with acute iliofemoral DVT early in their course and then offering them a strategy of thrombus removal will be the most significant step in the right direction in managing and eliminating this chronic problem. Once a patient has this degree of severe postthrombotic syndrome, it's important for physicians to keep in mind that there are reasonable treatment options that, if used successfully, can significantly change the patient's quality of life. If the disease involves the common femoral vein, the external iliac vein, common iliac vein, and vena cava, patency can be restored, which makes a major impact on their postthrombotic morbidity.

What advice would you give to vascular specialists looking for training or more information on these options?

First, if they're interested in the problem, doing a generous amount of background reading and personal investigation will be helpful. There are not many programs in the country that perform surgical procedures on these patients. If you can identify patients who have postthrombotic obstruction isolated to the iliac veins, you can make an enormous difference in their lives by managing them with percutaneous procedures to restore patency.

When embarking upon a hybrid procedure, of course you need interventionists who are skilled with passing guidewires and catheters through fibrotically occluded veins, but you also need a surgeon who is interested in performing these procedures, which are quite dissimilar from the endarterectomies performed for patients with atherosclerotic disease. These fibrous occlusions basically need to be cut out of the vein, rather than teased out, as we do with an atherosclerotic plaque. These procedures can be quite time consuming and labor intensive, both operatively and postoperatively. However, patients are extremely grateful, and the result is enormous satisfaction. ■

Anthony J. Comerota, MD, FACS, FACC, is Director of the Jobst Vascular Institute, The Toledo Hospital in Toledo, Ohio, and Adjunct Professor of Surgery at the University of Michigan in Ann Arbor, Michigan. He has disclosed that he has no financial interests related to this article. Dr. Comerota may be reached at anthony.comerotamd@promedica.org.