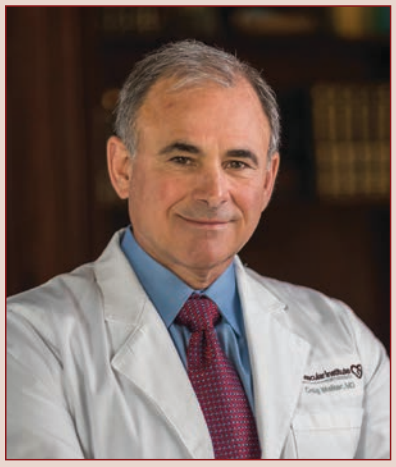
A Combined Open Surgical and Endovascular Approach When Treating Patients With Critical Limb Ischemia Is Often Superior to Either a Totally Surgical or Endovascular Approach



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Even though great strides have been made in treating peripheral arterial disease in general and specifically CLTI, amputation and death remain common in these patients. We need to improve. We must all work together to identify disease in earlier stages before there is deep-seated infection.

Hello and welcome to the January 2022 edition of *Vascular Disease Management*. There are multiple articles and case presentations of interest in this issue of the journal. I have chosen to comment on Dr. Vincent Demesmaker and colleagues' case report, "Using a Hybrid Approach to Treat Chronic Limb-Threatening Ischemia."

I chose this case report because chronic limb threatening ischemia (CLTI) has reached epidemic status globally. The most strongly associated risk factors are advanced age, diabetes mellitus, and smoking. Demographics suggest that the incidence of CLTI will continue to increase.

CLTI is associated with a substantial risk of major amputation, morbidity and mortality, and profound economic cost. Several reports have demonstrated that successful revascularization with interventional or surgical techniques is associated with greater amputation-free survival, decreased morbidity and mortality, and decreased cost. Despite these reports, many patients are treated with an amputation-first approach, with no assessment of vascular anatomy, on a worldwide basis.

This case report involved a patient who had been treated with 3 prior open surgical procedures. The last procedure resulted in ligation of the superficial femoral artery (SFA) at its origin, precluding an interventional approach to recanalize the femoral-popliteal segment. The patient had no remaining appropriate autologous conduit and had developed recurrent CLTI. An innovative technique of retrograde recanalization of the tibioperoneal trunk, popliteal artery, and SFA up to the point where the SFA had been previously ligated was coupled with a short, open-surgical Dacron graft conduit arising from the common femoral artery to the proximal SFA. This was coupled with successful stenting of the entire SFA and proximal popliteal artery, followed by subsequent percutaneous transluminal angioplasty of the remaining popliteal artery and tibioperoneal trunk, which provided a successful revascularization and favorable clinical outcome.

In my opinion, vascular assessment with at least duplex ultrasound should be performed in all patients presenting with CLTI. This can be performed quickly with no risk. Where advanced infection and amputation are imminent, duplex ultrasound can help determine the ideal level of amputation. In other patients, vascular assessment may uncover obstructive lesions easily treated with relatively simple interventional procedures. Unfortunately, most patients presenting with CLTI have multilevel disease with chronic, totally occluded vessels, which pose a greater challenge. These patients often have advanced cardiac, pulmonary, carotid, and metabolic disorders. Renal function is often significantly impaired. Many patients are not eligible

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for open surgical treatment because of these comorbidities, lack of appropriate conduit, or severe distal disease that is beyond typical distal anastomotic sites. With appropriate and complete vascular assessment, even the most complex lesions can be successfully treated in most cases at centers specializing in CLTI treatment.

The likelihood of successful revascularization in CLTI has improved dramatically in the last decade. New devices including better guidewires, distal protection tools, thrombus treatment devices, re-entry tools, innovative balloon technologies, improved stent designs, medicated stents and balloons, and new atherectomy devices are improving interventional success not just initially but with improved long-term patency. Newer techniques, including retrograde access, direct venous arterialization, and a hybrid surgical-intervention approach, are resulting in improved rates of revascularization. Improved medical therapy is showing great promise in decreasing the rates of recurrent CLTI post revascularization. Limb salvage teams that include vascular surgeons, interventionists, diabetic specialists, wound healing experts, podiatrists, infectious disease experts, and neurologists have demonstrated improved healing of wounds and decreased rates of amputation.

Even though great strides have been made in treating peripheral arterial disease in general and specifically CLTI, amputation and death remain common in these patients. We need to improve. We must all work together to identify disease in earlier stages before there is deep-seated infection. We must insist that vascular assessment with at least duplex ultrasound be performed prior to amputation. We must put aside fighting among various specialties and work together, utilizing the skills that each discipline can contribute to improve outcomes. We must continue to teach primary care physicians, podiatrists, wound healing experts, and other providers about the importance of early diagnosis, revascularization, and wound healing in patients with peripheral arterial disorders. We must continue to educate ourselves to ensure that we can offer our patients the best diagnostic and therapeutic options. We must realize that revascularization is only part of the therapy of patients presenting with CLTI. We must achieve complete wound healing and subsequently provide optimal follow-up with the close cooperation of our peers from other disciplines.

We have achieved much, but we must continue to evolve and improve as providers if we are to help all patients presenting with CLTI. ■

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