



Is Open Vascular Surgery or Endovascular Surgery the Better Option for Lower Extremity Arterial Occlusive Disease?

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Keywords

- Peripheral arterial disease • Critical limb ischemia
- Lower extremity arterial occlusive disease • Open vascular surgery
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Key points

- There are few areas of medicine that have as much equipoise with regard to optimal treatment as peripheral arterial disease.
- The decision to recommend surgical or endovascular revascularization varies significantly among providers and is based on a range of factors, including disease pattern, availability of autogenous conduit, training, surgical and endovascular skill sets, access to an appropriate procedural environment, and perhaps most importantly, disparate treatment biases.
- There is general agreement that some patients considered poor candidates for surgery are well served by endovascular revascularization.
- What is presently not known is which therapy is more suitably offered to patients who are candidates for both bypass and endovascular therapy.
- This lack of clarity in current treatment algorithms, especially for critical limb ischemia, has led to a confusion about standard of care, potential misuse of technology, and likely increased health care expenditure.

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INTRODUCTION

Lower extremity peripheral arterial disease (PAD) affects more than 200 million people worldwide and is a common cause of vascular morbidity [1]. Patients with PAD are at a threefold risk for major cardiovascular events compared with the general population [1,2]. The most common presentation of lower extremity PAD is intermittent claudication (IC) characterized by pain with ambulation in the muscle groups of the legs that is relieved with rest. The more severe form of lower extremity PAD is critical limb ischemia (CLI), categorized by ischemic rest pain or tissue loss [2].

There is significant equipoise in the treatment of lower extremity PAD, which can affect the aorto-iliac and infrainguinal arterial segments [2]. Traditionally, open surgery, such as surgical bypass with or without endarterectomy, was the main treatment strategy. Bypass can utilize autologous vein, prosthetic material, or cryopreserved vein. However, endovascular surgery with percutaneous vascular interventions have been used with increasing frequency [3]. These include balloon angioplasty, placement of stents or stent grafts, and atherectomy. In many centers, endovascular surgery has become the standard approach for first-line treatment of symptomatic PAD [4]. This increase is expected to continue, especially with the development of outpatient centers dedicated to the treatment of PAD [5]. Although both open and endovascular revascularization strategies are commonly performed, practice patterns vary widely across North America, leading to much controversy and debate about which option is optimal for any given patient.

There have been multiple retrospective analyses and one randomized clinical trial (RCT) looking at open surgical and endovascular treatment for IC and CLI, with no clear consensus due to limitations. Current RCTs, including the Best Endovascular versus Surgical Therapy in Patients with Critical Limb Ischemia (BEST-CLI) trial, a prospective randomized trial currently active in North America, as well as Bypass versus Angioplasty in Severe Ischaemia of the Leg (BASIL)-2 and BASIL-3, will be important to help guide future treatment of these patients [6].

AORTOILIAC DISEASE

The Society of Vascular Surgery recently released official recommendations for treatment of aortoiliac occlusive disease in IC [7]. Endovascular interventions with selective stenting was recommended as the first line of treatment for focal lesions. Covered stents were recommended for severely calcified or aneurysmal vessels. Patients with diffuse disease, defined as extensive aortic disease or disease involving both the common and external iliac arteries, were recommended for either endovascular surgery or vascular bypass as long as the endovascular interventions do not preclude future bypass options. Bypass was recommended for patients at reasonable risk and with disease not amenable to endovascular interventions or after failed endovascular interventions.

Surgical options for unilateral disease include inline aorto-femoral bypass or extra-anatomical bypasses, such as axillary-to-femoral or femoral-to-femoral

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