Perspectives on Limb-Threatening ALI Management

Imaging preferences, avoiding misdiagnosis, anatomic and patient considerations, essential interventional therapies, and decision-making between an endovascular and open approach.

With Frank R. Arko III, MD

First, how are you imaging to ensure accurate diagnosis and optimal treatment planning?

The majority of patients with acute limb ischemia (ALI) in our practice come either from the emergency department or from a transferring facility with the diagnosis of ALI. I would say that nearly 90% of these patients have undergone a CTA of the abdomen and pelvis with run-off. The other 10% have physical examination findings alone or a duplex ultrasound consistent with acute occlusion. If the patient is delayed either for treatment or for transfer for reasons unrelated to physician willingness to treat, I personally like to have cross-sectional imaging to help speed the diagnosis and expedite therapy for revascularization.

What are some potential misdiagnosis pitfalls, and how can they be avoided?

The diagnosis of ALI is relatively uncommon to be missed by those who actually treat the disease. However, when patients do present to primary care, they will present with neurologic-type symptoms such as numbness and weakness, which can lead to a delay in diagnosis if an adequate pulse examination is not performed. It is important to evaluate both extremities to determine any discrepancies between the two legs. The leg can also appear cool and pale, which often leads to a venous workup to include deep vein thrombosis, which is often negative. Both scenarios can cause delays in the actual diagnosis and can lead to later presentations and increased complications, the need for fasciotomy, and lastly, the risk of limb loss and death.

How does the ALI population differ from chronic limb-threatening ischemia (CLTI), and how does this affect decision-making?

Most ALI patients will present rather suddenly for a host of reasons, typically secondary to embolization from a more proximal source. This is often related to dysrhythmias (atrial fibrillation) or the sudden cessation of anticoagulants. Another group that is often seen in the ALI group is those with a newly diagnosed hypercoagulable state and or an underlying malignancy. CLTI is a more chronic group that presents over a longer duration of time. However, there can certainly be those with CLTI who can present with ALI secondary to an acute thrombosis of underlying disease, although this is rare. Patients with ALI often need emergent or urgent procedures, while those with CLTI can be worked in on a more elective basis.

How do you decide between open, interventional, and hybrid approaches? Which anatomic and patient factors lead to one decision versus another?

At this point I would say that our group has a tendency in the majority of cases to proceed with an endovascular-first approach based on several reasons. First, we are in a large system with a significant practice in ALI and a mature practice overall. We have access to imaging 24/7 with our own dedicated teams for vascular,

making an endovascular approach simple and easy to roll into the day. There are a host of devices currently available from an endovascular standpoint to manage patient with ALI, and most are single session or are intended to be single session. Access to the endovascular suite is quick and does not require anesthesia, and there are several recent studies that support the use of an endovascular-first approach. This includes the data from Poursina et al as well as the recent STRIDE trial, which looks at the use of vacuum-assisted mechanical thrombectomy.[1,2] Technical success rates for both studies were very high, with high limb salvage rates that mirrored or were better than surgery. Furthermore, the need for fasciotomy was also very low in both trials. It is my opinion that revascularization is quicker with an endovascular-first approach and the resultant deleterious effects of reperfusion are less. For example, a patient with multilevel clot in the common femoral artery (CFA), superficial femoral artery, profunda, and popliteal artery, when treated endovascularly first, gets quicker clot removal with restoration of flow that is not interrupted for prolonged times. In that case, when an endovascular approach is utilized, the clot can first be removed from the CFA and the profunda femoral artery with immediate flow to the deep vessel and the majority of the leg, allowing then removal of clot from the rest of the leg while there is some perfusion. When an open technique is used, the vessel is controlled and the leg is ischemic throughout, while each vessel undergoes embolectomy. The profunda does not get perfused until the CFA is repaired.

Do we need more research, particularly randomized controlled trials (RCTs), in this setting?

More data never hurt, but I am unsure of the need for RCTs for this disease process. Certainly, there is no role for pure medical therapy in most cases. Thus, an RCT would come to open surgery versus endovascular intervention. No matter the results, I am not sure that it would convince those with strong beliefs in either to change their opinions, but I certainly could be wrong. In my opinion, the current data certainly support instituting an endovascular approach first if a practice has the means to incorporate it.

If treating interventionally, what are your essentials for effective therapy without residual thrombus? How do you decide which platform to use, given the variety of options available?

I have a tendency to be biased toward use of aspiration. I was an early adopter and have become rather facile in its use. I have utilized other rotational atherectomy and aspiration devices with some success, but I believe that there is a true and real risk for embolization. I have been very satisfied with pure aspiration devices.

When do you use thrombolytic therapy?

I do believe there is still a role for the use of lytics. They can be used initially in an appropriate subset of patients. However, my use of lytics has been more niche and is often when I am unsatisfied with my single-session treatment or if I have removed 50% of the clot and distal outflow becomes an issue. I feel it is in this role that I use lytics the most.

What is your postprocedural strategy for preventing recurrence in terms of medical management and follow-up?

The typical answers would apply here: risk factor modification to include smoking cessation, appropriate use of anticoagulants, appropriate workup for hypercoagulable states, and routine follow-up in clinic and surveillance. ■

1. Poursina O, Elizondo-Adamchik H, Montero-Baker M, et al. Safety and efficacy of an endovascular-first approach to acute limb ischemia. J Vasc Surg. 2021;73:1741-1749. doi: 10.1016/j.jvs.2020.10.002
2. Maldonado TS, Powell A, Wendorff H, et al. Safety and efficacy of mechanical aspiration thrombectomy for patients with acute lower extremity ischemia. J Vasc Surg. 2024;79:584-592.e5. doi: 10.1016/j.jvs.2023.10.062.

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