

ASK THE EXPERTS

What Are Your Surveillance Protocols After Below-the-Knee Interventions, and What Determines the Need for Reintervention?

Experts discuss their approach to postprocedural management.

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Tibial interventions have a known high rate of restenosis, and the OLIVE trial has demonstrated that up to 40% of patients may need repeat intervention to maintain arterial patency for the duration of wound healing. In addition, due to the watershed distribution of wounds seen in patients with below-the-knee arterial disease, staged intervention of secondary tibial pathways may be needed for optimal results. Clearly, this speaks to the need for diligent surveillance in these patients to ensure maintained patency after endovascular therapy and guide ongoing treatment decisions.

The first element of our protocol is to obtain wound images at the initial evaluation and all subsequent consultations so wound progression can be visually assessed.

This is a key determinant of whether or not revascularization is adequate. Patients are seen 3 to 4 weeks after the procedure with arterial imaging as well. Subsequent to this, office assessments are scheduled every 4 to 6 weeks depending on wound severity (more often with advanced ulcers or gangrene) and within 1 week of any minor amputations. Repeat imaging is performed based on findings of clinical evaluation and physical examination, although as a general rule, arterial imaging is performed 3, 6, and 12 months after the procedure.

In cases with uncertain healing potential, we will liberally utilize transcutaneous oxygen testing to further determine if perfusion is adequate or if additional therapy is needed. This is particularly true for patients with forefoot ulceration and known untreated pedal arch disease, because poor perfusion indices indicate a need for plantar pedal loop intervention.

Finally, patients are counseled to see us immediately if they have increased foot pain or redness, worsening of wounds, or signs of infection (redness, malodor, or increasing wound drainage). Early identification of problems is paramount to timely and appropriate reintervention to save limbs!


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Every patient who undergoes endovascular therapy at our institution has duplex ultrasound the day after the procedure to assess the immediate postprocedural result as well as determine if any acute complications and treatment failures (access site, target vessel acute reocclusion) have occurred. In patients with critical limb ischemia (CLI) and

wounds, a preprocedural wound assessment is performed to have a baseline with which to compare for follow-up.

Because early failure of below-the-knee treatment can occur due to acute recoil, we schedule all patients for follow-up duplex ultrasound within 6 to 12 weeks after the procedure to evaluate vessel patency. If the vessels are occluded or have high-grade reobstructions and the clinical status of the patient has not improved within that time, they are scheduled for reintervention.

Patients who are not able or willing to come back for a face-to-face follow-up are contacted by phone every 3 months. If the patients or their caregivers report nonhealing wounds, these patients are scheduled for reintervention. For patients with CLI and wounds, follow-up includes a rigorous wound care program, which is done in cooperation with the diabetic foot clinic and plastic surgery.


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Currently, there are no established evidence-based guidelines regarding surveillance protocols after endovascular revascularization. For suprainguinal and femoral disease, we often perform duplex ultrasound and associated ankle-brachial indices (ABIs) at 1 month, 6 months, and annually after the endovascular procedure at the patient's office visit. However, surveillance for tibial revascularization is on a case-by-case basis because most interventions below the knee are performed for wounds and rest pain, not for lifestyle-limiting claudication.

My surveillance protocol for below-the-knee intervention includes an office visit at 1 month postprocedure. An interval history is performed to assess progress of clinical symptoms. A full vascular examination of the affected limb is performed, and ABIs are also performed. If the wound is healing or rest pain has resolved, the next office visit is at 3 months postintervention with the same interval history, vascular examination, and ABIs. I will routinely see a patient on a 3-month interval until the wound heals and, even then, bring the patient back for surveillance every 6 months for 2 years to ensure there is no recurrence.

If the wound is not healing or rest pain has not resolved within the initial 1-month postprocedure visit, I perform arterial duplex ultrasound to assess for further possible interventions, including open revascularization options. My threshold for reintervention includes any patient with recurrent symptoms of rest pain with evidence of recurrent stenosis by duplex ultrasound or drop in ABI by > 0.15 and any patient with a nonhealing stagnant wound.


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Our institution is located in a suburban area, which determines our postprocedure follow-up protocol for patients with CLI. At least 50% of these patients are traveling more than 100 km to our institution. For these

patients, we recommend that they enroll in a local patient wound care program, organized by either the referring physician (vascular specialist) or hospital. For patients who live close by, we recommend that they present for follow-up examinations every 3 months for the first year. The patient workup consists of clinical examination, oscillometry including the toes, ABIs and toe-brachial indices, and duplex ultrasound. Postinterventional wound care is provided by local wound care centers or ambulatory services at home. The indications for reintervention and/or diagnostic angiography include documented restenosis and delay in or worsening of wound healing or worsening or no wound healing without proof of restenosis/reocclusion confirmed by duplex ultrasound. ■