

Extreme Wound Healing: Acute Limb Ischemia Superimposed on Chronic Limb Ischemia



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CASE REPORT

A 78-year-old female presented to the emergency department with a 2-week history of worsening, intractable, left lower extremity pain. For the past several months, the patient had been undergoing treatment for a large non-healing wound after a left great toe amputation. Her past medical history was significant for severe peripheral arterial disease with chronic lower extremity pain/rest pain, insulin-dependent diabetes mellitus, hypertension, hyperlipidemia, and previously treated osteomyelitis of the left foot.

Her past endovascular and surgical history revealed prior left superficial femoral artery (SFA), left popliteal artery,

and proximal left anterior tibial artery stents placed at an outside hospital. She had no prior bypass surgery. The patient has never used tobacco and was a non-bypass candidate. Her labs: CBC, BMP, PT/PTT/INR, and fibrinogen, were all within normal limits. Her medications were as follows:

Xarelto 15 mg po;
Lipitor 80 mg at bedtime;
Zyrtec 10 mg daily;
Dakin's Solution 1/4 strength daily topically to affected area;
Glimepiride 4 mg po daily;
Cozaar 100 mg po daily;
Metoprolol 100 mg every 12 hours;
Bactroban 2% ointment daily to

affected area;
Nifedipine XL 60 mg po daily;
Protonix 40 mg po daily;
Insulin sliding scale;
Percocet 1 tab q 6h prn po for severe pain.

On exam, the patient had a large non-healing wound at the site of prior left great toe amputation (Figure 1). The left lower leg and left foot were cool with decreased sensation, but intact motor/strength. Her left common femoral artery (CFA) pulse was 1+ with non-Doppler and non-palpable left popliteal artery and pedal pulses.

Non-invasive arterial study showed flattening of the waveforms in the left thigh and below the knee, compatible with left femoral-popliteal disease and left tibial-peroneal artery occlusive disease (Figure 2).

Given the patient's presentation, acute limb ischemia (ALI) superimposed on chronic limb ischemia (CLI) was suspected. The patient was taken to the angio suite for pelvic and left leg angiography with intervention.

Right CFA access was obtained with placement of a 6 French (Fr) sheath (Terumo). A 5 Fr Omni Flush catheter (AngioDynamics) was advanced into the

distal abdominal aorta. A pelvic angiogram was performed in the anterior-posterior (AP) and bilateral 30-degree oblique projections (Figure 3). A 4 Fr Cobra catheter (AngioDynamics) was then used to selectively catheterize the distal left CFA with an .035-inch Glidewire (Terumo). A left leg angiogram was performed, showing sluggish flow in the left SFA suggestive of distal occlusion (Figure 4). Additional imaging confirmed an occluded left popliteal artery at the knee joint with no significant below-knee runoff, except for reconstitution of an isolated distal left peroneal artery without opacification of the pedal arch (Figure 5).

Since ALI superimposed on CLI was suspected given the patient's presentation, the 4 Fr Cobra catheter was exchanged for an .035-inch Amplatz guidewire (Boston Scientific) and the 6 Fr sheath at the right groin was exchanged for a 6 Fr, 45 cm Destination sheath (Terumo), which was advanced into the left external iliac artery. A 5 Fr Cragg-McNamara catheter (30 cm infusion length) (Medtronic) was advanced over the guidewire so that its proximal marker was in the proximal SFA and its distal marker was in the proximal

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Figure 1. Large non-healing wound status post left great amputation.

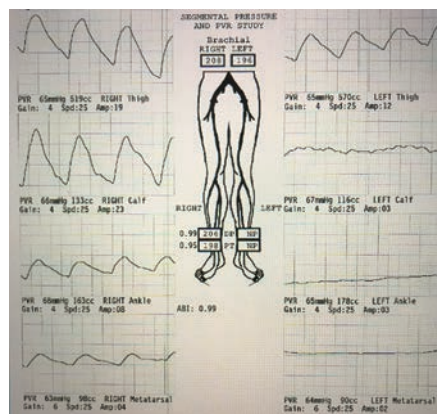


Figure 2. Non-invasive arterial study shows flattening of the waveforms in the left thigh and below the knee, compatible with left femoral-popliteal disease and left tibial-peroneal artery occlusive disease.



Figure 3. Pelvic angiogram shows no hemodynamically significant inflow stenosis.

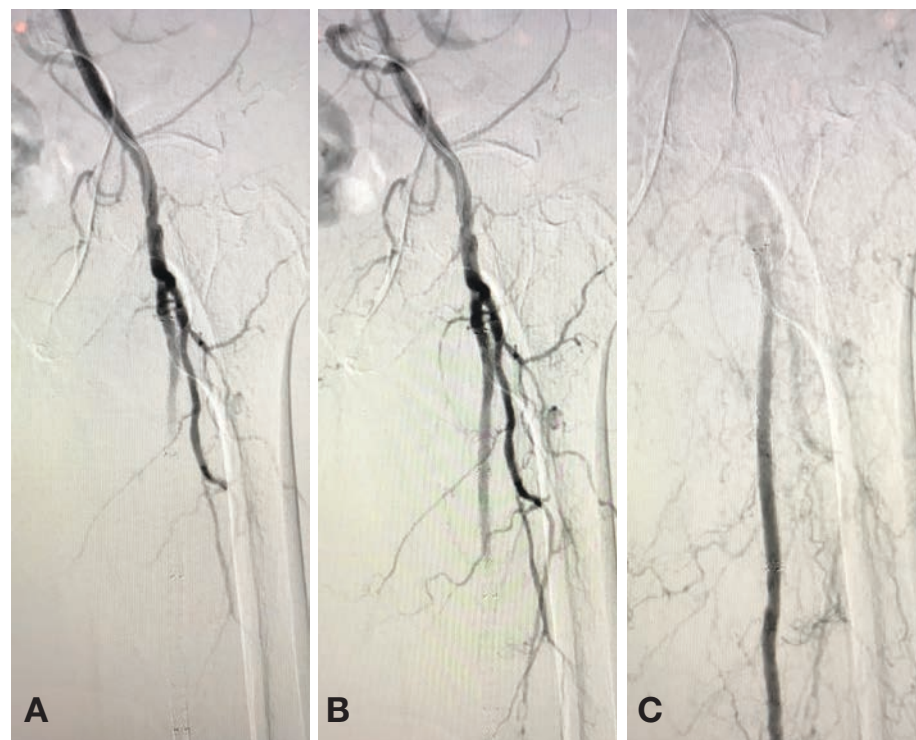


Figure 4. Left leg angiogram shows sluggish flow in the left SFA, suggestive of distal occlusion.

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Figure 5. Left leg angiogram confirms an occluded left popliteal artery at the knee joint, with no significant below-knee runoff and reconstitution of the distal left peroneal artery without opacification of the pedal arch.

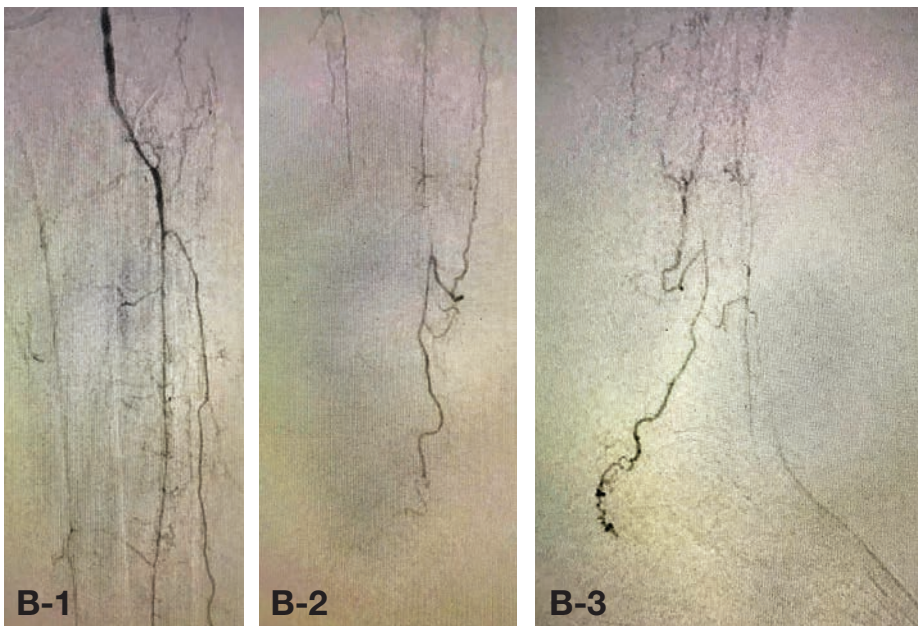
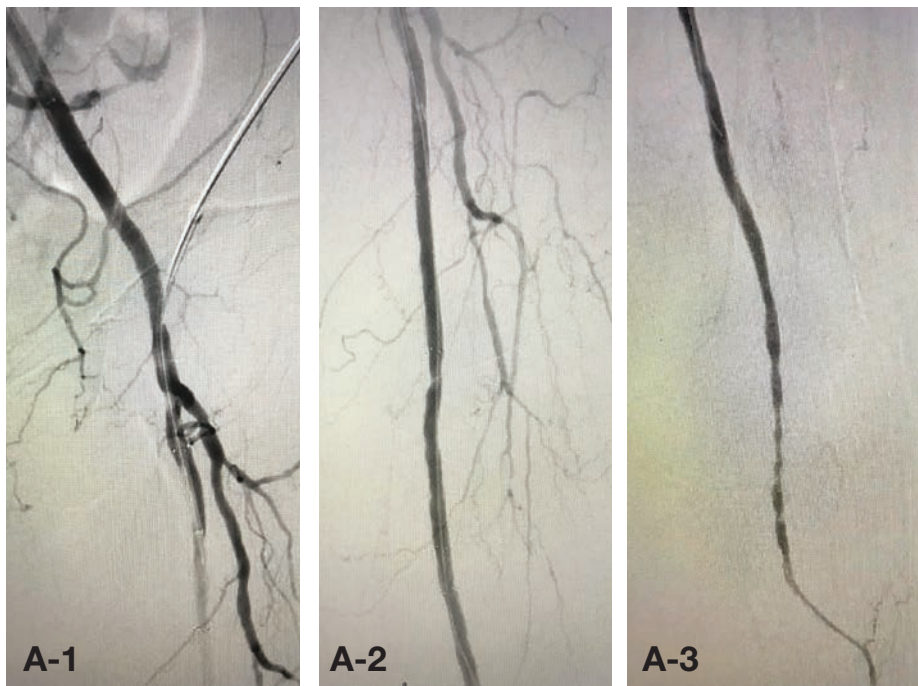


Figure 7A-B. Left leg angiogram after overnight tPA thrombolysis (total of 10 mg) shows a patent but diseased left popliteal artery, and visualization of previously unseen collaterals with poor runoff and no significant pedal arch.

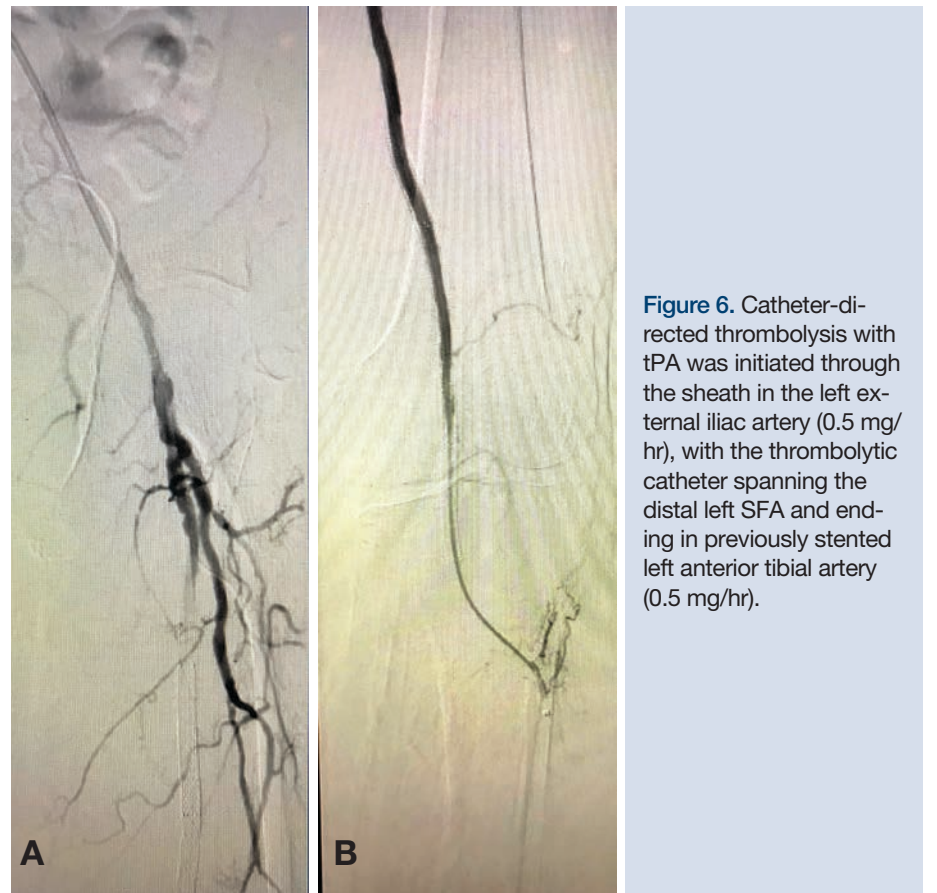


Figure 6. Catheter-directed thrombolysis with tPA was initiated through the sheath in the left external iliac artery (0.5 mg/hr), with the thrombolytic catheter spanning the distal left SFA and ending in previously stented left anterior tibial artery (0.5 mg/hr).

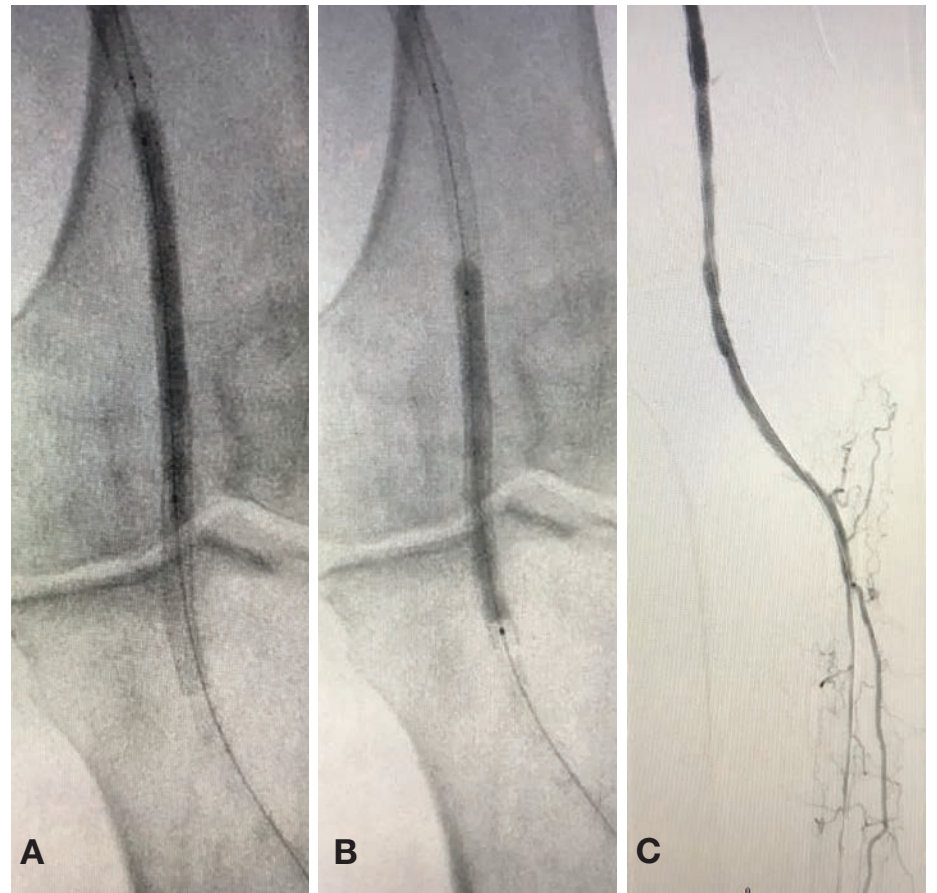


Figure 8. Excellent angiographic result after 6mm plain old balloon angioplasty (Ultraverse, Bard Peripheral Vascular) followed by a 6 mm AV Lutonix drug-coated balloon (2-minute inflation for both) (Bard Peripheral Vascular).

left anterior tibial artery. Thrombolysis (tPA) was initiated through both the Destination sheath in the left external iliac artery (0.5 mg/hr), and the thrombolytic catheter in the distal SFA and left anterior tibial artery (0.5 mg/hr) (Figure 6). After overnight thrombolysis with 10 mg tPA, a repeat left leg angiogram showed a patent but diseased left popliteal artery and visualization of previously unseen collaterals, with poor runoff and no significant pedal arch (Figure 7A-B). The stenoses

in the previously stented left popliteal artery were treated with 6 mm plain balloon angioplasty (POBA) followed by a 6 mm AV Lutonix drug-coated balloon (Bard Peripheral Vascular) (2 minute inflation for both) with an excellent angiographic result (Figure 8). This was followed by recanalization and 3 mm POBA of the anterior tibial artery chronic total occlusion (CTO) and 2 mm POBA of the dorsalis pedis artery (3 minute inflation at each site) (Figure 9). Post intervention, there

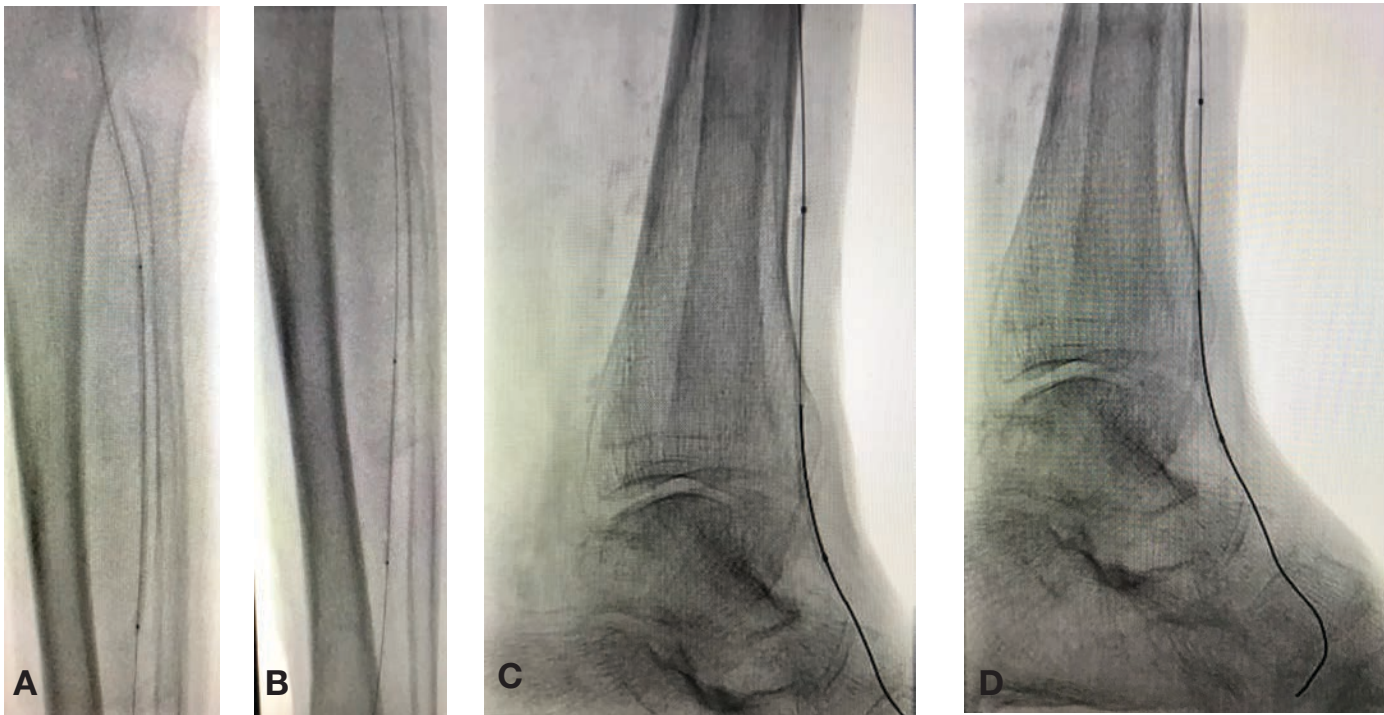


Figure 9. Recanalization and 3 mm plain old balloon angioplasty of anterior tibial artery CTO and 2 mm plain old balloon angioplasty of dorsalis pedis artery (3 minute inflation at each site).

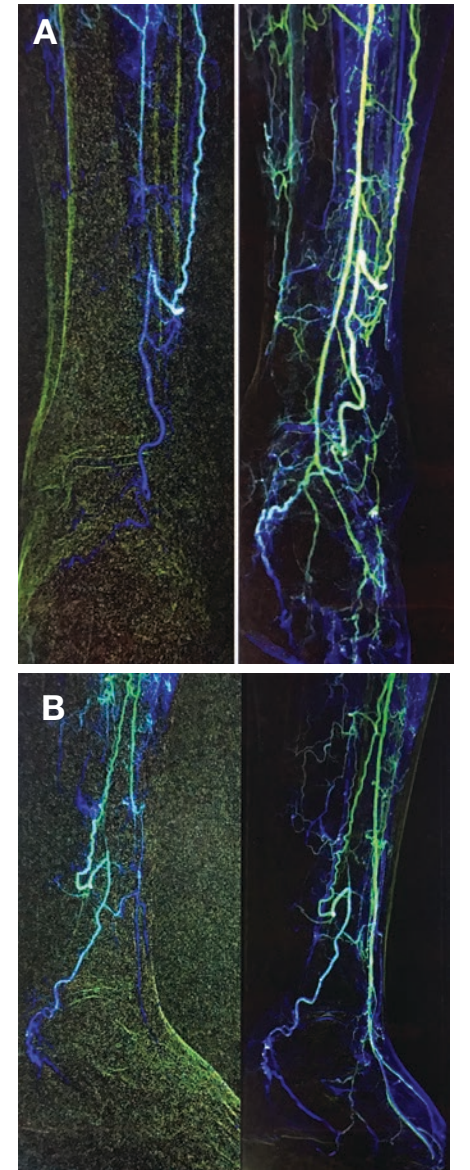
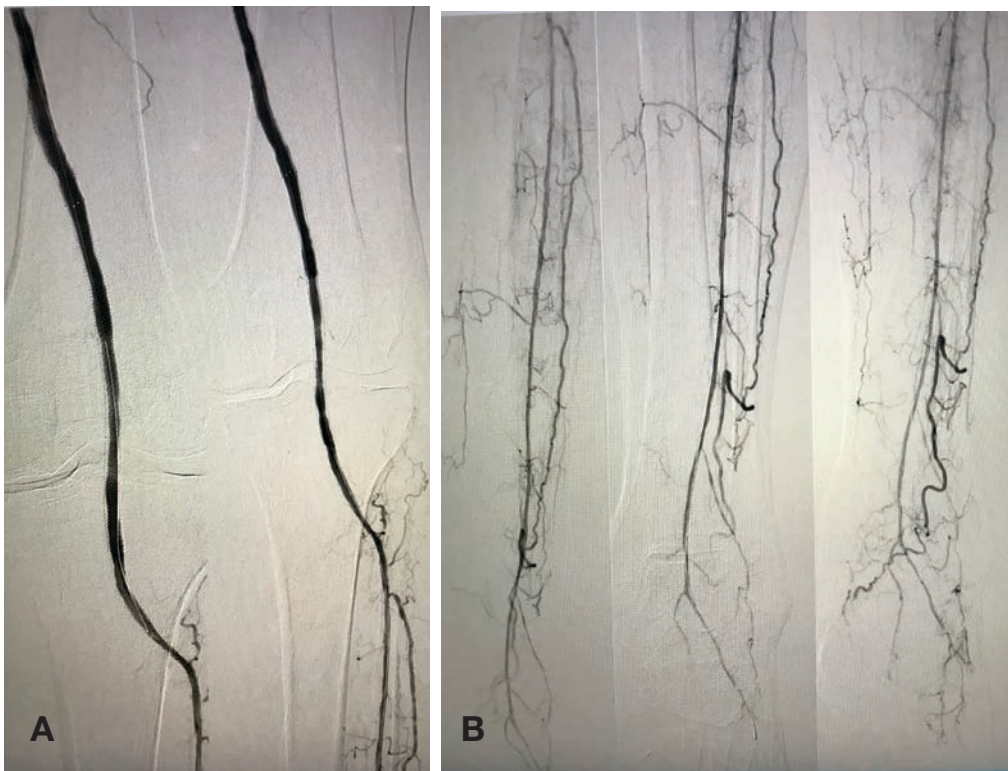


Figure 11. Pre and post intervention AP and lateral 2-dimensional perfusion images confirmed improvement of the runoff to the foot and amputation site.



Post intervention images confirmed in-line flow to the foot via the left anterior tibial artery and dorsalis pedis artery.

Figure 10. In-line flow re-established to the foot via the left anterior tibial artery and dorsalis pedis artery.

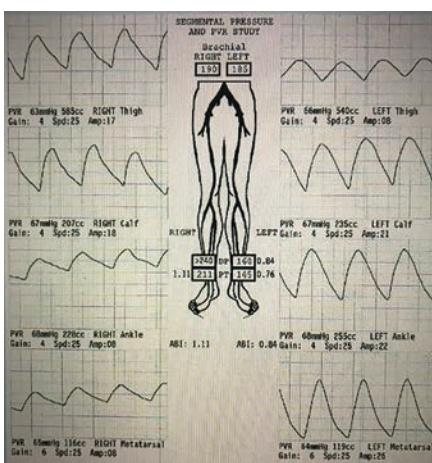


Figure 12. Post intervention non-invasive arterial study shows physiologic improvement of blood flow to the left leg post intervention.



Figure 13. One year post intervention, the large non-healing wound at the prior amputation site is healed, preventing further amputation.

was an excellent angiographic result, with in-line flow re-established to the foot via the left anterior tibial artery and dorsalis pedis artery (Figure 10). Pre and post intervention AP and lateral 2-dimensional perfusion images (Siemens Healthineers) confirmed improvement of the runoff to the left foot and amputation site (Figure 11A-B). The next morning, the patient underwent non-invasive arterial imaging that showed physiologic improvement of blood flow in the left leg and foot post intervention (Figure 12). The patient was followed closely by interventional radiology doctors in our outpatient vascular clinic every 3 months and by our wound care center doctors. One year post intervention, the large non-healing wound at the prior amputation site was healed (Figure 13), preventing further amputation. ■

Disclosure: Dr. Tummala reports he is a speaker for BD Peripheral Vascular.

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