

# Current Awareness and Treatment of Critical Limb Ischemia

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**CASE:** A 59-year-old male laborer presented with a non-healing, left great-toe ulcer. He also described severe rest-pain in his same forefoot. His past history was significant for insulin-dependent diabetes mellitus (IDDM), hypertension, dyslipidemia, renal insufficiency, obesity and 40 pack/years of smoking.

The patient was recently evaluated at a remote wound center where he underwent serial wound debridement and ongoing wound assessment. Plain radiographs were obtained, which demonstrated no evidence of subcutaneous emphysema or osteomyelitis. The patient was offered ongoing debridement or toe amputation. He presented to us for further evaluation and to discuss additional therapeutic alternatives.

On examination the foot was cool with delayed capillary refill, atrophy of the skin and hair loss. There was a normal femoral and popliteal artery pulse, and a monophasic posterior tibial artery doppler signal with dependent rubor and pallor with elevation. The ankle-brachial index was at rest. The deep partial-thickness ulcer was on the distal great toe, measuring 1.5 cm in diameter, with clean, sharp margins. There was no odor, purulence or erythema. Serum creatinine was 2.3.

Duplex revealed normal findings to the level of the popliteal artery. The anterior tibial and peroneal arteries were visualized in their proximal third with monophasic flow and chronic total occlusion (CTO) distally. The posterior tibial artery had monophasic flow at the level of the medial malleolus and into the plantar arch, but a CTO was present proximally, preventing continuity with the tibial-peroneal trunk.

**DISCUSSION:** Critical limb ischemia (CLI) from limb-threatening peripheral arterial disease (PAD) is approaching epidemic levels in the United States<sup>1</sup>. Patients suffering from CLI with ischemic ulceration can be among the most challenging patient demographic to treat, due to the advanced level of their PAD and the host of cardiopulmonary and other severe comorbidities that frequently accompany this disease.

An effective approach to treating PAD begins with education. Patient, as well as physician, education is imperative to the success of any program. The therapies and technologies involving endovascular techniques are rapidly evolving. It is incumbent upon the vascular team to provide ongoing education to both the referring physicians and the lay public in order provide safe and appropriate care to PAD patients.

Additionally, maximizing nonsurgical management – including smoking cessation, dietary/nutritional instruction, supervised exercise programs, hypertension control and anti-platelet therapy – is paramount in this patient population.

This patient underwent successful endovascular reconstruction of his left posterior tibial artery via a retrograde posterior tibial artery access at the medial malleolus, utilizing ultrasound for the majority of imaging. Laser atherectomy and balloon angioplasty were performed to reconstruct the artery. Completion angiography demonstrated continuity of flow through the reconstructed segment

from the popliteal artery through the plantar arch with no residual stenosis. Less than 10 cc's of contrast agent and two minutes of ionizing radiation were used due to the utilization of duplex imaging. At one month after revascularization, the patient had resolution of his rest-pain and his toe ulcer was completely epithelialized.

Major limb loss has profoundly devastating consequences affecting the physical, emotional and occupational qualities of life. The negative economic impact on the GNP of the United States from amputation is well described<sup>2,3</sup>. Although the financial benefit of amputation avoidance is indisputable and must be considered, it has even greater value from the patient's perspective.

As one of the greatest minds of the 20th century advised, "Not everything that counts can be counted, and not everything that can be counted counts."<sup>4</sup>

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2) Gaziani, L. Comprehensive approach to management of critical limb ischemia. *Curr. Treat. Options Cardiovasc. Med*. 2014 Sep; 16(9):332.

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4) Albert Einstein