The use of "off the shelf" percutaneous deep venous arterialization technology for a patient with severe chronic limb ischemia with no other options for limb salvage

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The authors present a very interesting case report using "off the shelf" technology to perform percutaneous deep venous arterialization (pDVA) in a high-risk patient who presented with chronic limb-threatening ischemia and was considered to have "no option" for arterial reconstruction owing to the lack of tibial or pedal targets for revascularization. The authors used pDVA to establish a pathway for arterial perfusion via the tibial and plantar venous system. The reason for the "off the shelf" designation for the technique is that although a commercial system for pDVA exits, it is not yet approved by the Food and Drug Administration. The data supporting this approach for "no-option" patients have been reported from the PROMISE (percutaneous deep vein arterialization for the treatment of late-stage chronic limb-threatening ischemia) I and PROMISE II trials using the LimFlow system.[1,2] The LimFlow system has not been approved by the Food and Drug Administration at this time.

The case report involves a patient with Buerger disease who presented with rest pain, dry gangrene of the toes, and chronic limb-threatening ischemia. Although the ankle brachial index was reasonable (0.62), the toe brachial index was 0. Given the discrepancy between the clinical presentation and the noninvasive diagnostic test results, the authors performed diagnostic arteriography. The arteriogram showed mildly diseased iliofemoral-popliteal segments. The posterior tibial and peroneal arteries were occluded, and the anterior tibial artery was occluded in the distal calf with poor perfusion of the foot. Thus, the patient was a "no option" for arterial revascularization. The pDVA procedure was performed successfully. At 2 weeks after the procedure, the patient experienced progression of the distal toe gangrene and continued rest pain and required embolization of two significant venous tributaries. Follow-up imaging at 2.5 months showed a patient pDVA with antegrade flow into the foot. A transmetatarsal amputation was performed with complete healing.

It should be noted that this case presents differently than several previous reports describing the successful use of endovascular procedures for patients with Buerger disease.[1,2] pDVA was used because their patient was considered to be in the "no-option" category without viable alternative interventions. A second point is the necessity for a reasonable arterial supply down to the tibial/peroneal trunk for the use of pDVA. Third, endovascular or surgical interventions (including pDVA) for patients with Buerger disease should be reserved for those patients who will adhere to strict risk factor modifications (including smoking cessation), wound care regimens, and close clinical and imaging surveillance. These requirements can be very challenging for patients with Buerger disease requiring interventions for limb salvage.

As noted by the authors, data from the PROMISE I and PROMISE II trials have been very encouraging, and those trials used the commercially available LimFlow system for pDVA.[3,4] Hopefully, the LimFlow system will be approved in the near future by the Food and Drug Administration for use for these very challenging "no-option" patients.

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