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Percutaneous deep venous arterialization (pDVA) has emerged as a last-resort revascularization option for patients with no-option chronic limb-threatening ischemia (CLTI). In Japan, however, dedicated pDVA devices are not yet available, and off-the-shelf pDVA techniques, including VAST, remain the only endovascular alternatives. These techniques generally require percutaneous venous puncture and venous sheath insertion, which may be technically challenging in small or collapsed distal veins.

Case Presentation:

We developed the Antegrade ArterioVenous Fistula (A2VF) technique, a novel intravascular ultrasound (IVUS)-guided arterial-only approach that enables foot arteriovenous fistula (AVF) creation without percutaneous venous puncture or venous sheath insertion. A man in his 60s receiving maintenance hemodialysis presented with no-option CLTI and dry gangrene of the second toe. Conventional arterial revascularization and adjunctive low-density lipoprotein apheresis failed to achieve wound improvement because severe calcification prevented revascularization of the lateral plantar artery. Using the A2VF technique, successful arterial-to-venous crossing was achieved from the posterior tibial artery to the accompanying posterior tibial vein under IVUS guidance, followed by valvotomy and venous tract dilatation. Final angiography demonstrated robust flow through the plantar venous arch. Healthy granulation tissue developed within 1 month, and complete wound healing was achieved at 3 months.

Conclusion:

In our initial experience of nine patients, the A2VF technique was successfully performed without procedure-related complications, supporting the feasibility of this novel venous-puncture-free, arterial-only approach for selected patients with no-option CLTI.