

From the Midwestern Vascular Surgical Society

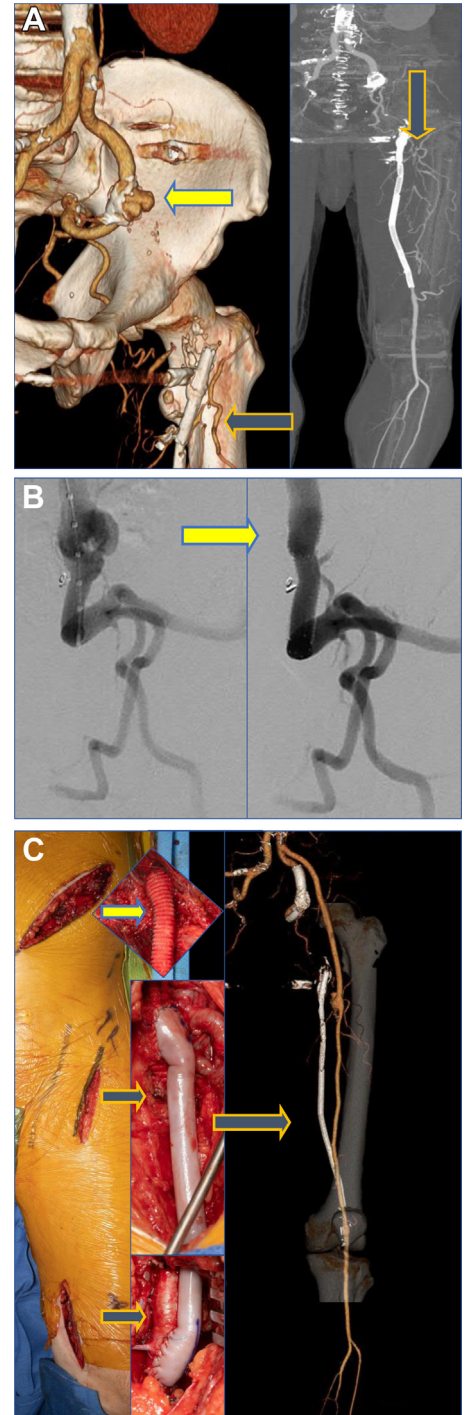
## Hybrid management of critical limb ischemia with a novel bioengineered vascular conduit

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A 61-year-old man presented with disabling short-distance left lower extremity claudication. Surgical history was significant for an emergency laparotomy, bowel resection, temporary colostomy, external iliac artery ligation, and right-to-left cross-femoral graft for damage control after a gunshot injury in 1982. This graft occluded a year later, and he underwent an iliofemoral interposition graft. Progression of peripheral arterial occlusive disease necessitated a left femoral endarterectomy with profundo-plasty and superficial femoral artery stenting 20 years later. The patient underwent endovascular attempts to maintain the patency of the left iliofemoral and infrainguinal segment, all ultimately failed. When referred, his ankle brachial index was 0.21 and he could not work (construction contractor). Imaging revealed an occluded left iliofemoral and superficial femoral artery, a pseudoaneurysm at the proximal old left iliofemoral bypass with extensive collaterals from the left internal iliac to the left profunda (A). He had no usable vein to use as conduit.

The patient underwent redo arterial reconstruction using a hybrid approach. We first used a left transbrachial approach for the placement of stent grafts to exclude the left iliofemoral pseudoaneurysm, preserve pelvic flow, and simplify the subsequent open operation (B). At a staged operation, we performed a left common iliac (left retroperitoneal approach) to profunda (lateral approach) bypass with an 8-mm Dacron and a jump graft to the above-knee popliteal artery using a 6-mm Human Acellular Vessel (Humacyte). This novel conduit was approved under the Food and Drug Administration expanded access program for compassionate use in non-constructible infrainguinal peripheral arterial occlusive disease. He was discharged with a palpable pulse and normal ankle brachial index within a week. He is back to work and reports no claudication with a patent reconstruction without aneurysmal degeneration 13 months later (C). The patient consented to the publication.

Revascularization for failed iliofemoral bypass that has been performed for complex injury is challenging due to scar surrounding the pelvic vasculature, routing of any vascular conduit under the inguinal ligament, and the need to establish good arterial outflow. Developing an optimal



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reconstructive plan for complex situations requires patient-specific approaches that can be aided by new endovascular and regenerative medicine technologies to optimize long-term outcomes.<sup>1-3</sup>

## REFERENCES

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