

**Table.** Results from chart review of a single surgeon's experience with endovascular management of cryopreserved conduit complications

Patient	Age/sex	Indication for initial surgery	Procedure performed	Conduit	Indication for conduit
1	64/M	Common femoral artery aneurysm, proximal stenosis of autogenous vein bypass graft	Aneurysm resection and reconstruction. Bypass from common femoral artery to distal aspect of autogenous vein graft	Cryopreserved saphenous vein	Lack of autogenous vein
2	60/M	Critical limb ischemia, autogenous vein bypass graft occlusion	Common femoral artery to peroneal artery bypass	Cryopreserved saphenous vein	Lack of autogenous vein
3	81/M	Hemorrhage from paneled autogenous femoral vein aortic reconstruction in setting of infection	Aortic interposition graft	Cryopreserved aorta	Infected field
4	57/M	Infected synthetic aortobifemoral bypass	Aortobifemoral reconstruction	Cryopreserved femoral vein	Infected field
5	61/M	Critical limb ischemia with tissue loss and metatarsal osteomyelitis	Femoral to posterior tibial bypass	Cryopreserved saphenous vein	Lack of autogenous vein

**Brachial Artery Pseudoaneurysm in a Four-Week-Old Infant**

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A 4-week old, full-term, healthy male was admitted to the neonatal intensive care unit for phototherapy secondary to neonatal physiologic hyperbilirubinemia. At that time, a 23-gauge peripheral intravenous catheter was placed in the left antecubital region. Approximately 1 week later, the mother noticed swelling in the left antecubital region. The mother took the patient to her primary care doctor, who diagnosed that infant with a superficial cellulitis and prescribed antibiotics and steroids. There was no improvement in the left upper extremity swelling, and 22 days later, the patient presented to the emergency department. On physical exam, the patient had palpable radial pulses in both upper extremities and no other abnormalities except for a 2 cm × 3 cm round, raised, pulsatile mass in the left antecubital fossa. An ultrasound of the left arm demonstrated a 2.7 × 1.5 cm left brachial artery pseudoaneurysm. The patient was admitted to the hospital at that time, and vascular surgery was consulted. A complete left upper extremity vascular duplex was ordered, which demonstrated a left 1.5 cm × 2.1 cm brachial artery pseudoaneurysm with to and fro flow extending to the left subclavian artery. The neck was measured at 14 cm. Due to the concern that the pseudoaneurysm was in fact coming from the left subclavian artery, a magnetic resonance angiography was ordered. It demonstrated a smoothly marginated vascular mass measuring 2.5 × 1.7 × 2.0 cm in the medial aspect of the left mid forearm. The patient was taken to the operating room for repair of the pseudoaneurysm. Following the skin incision, a cystic structure

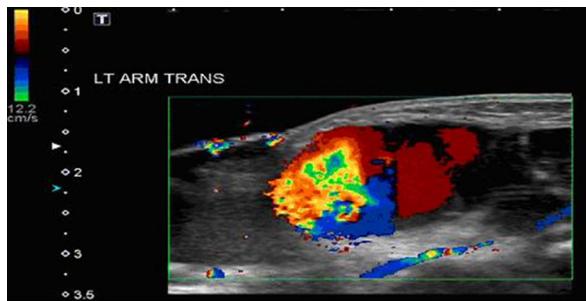


Fig 1.



Fig 2.

consistent with a pseudoaneurysm was encircled and dissected circumferentially off the artery. The brachial artery was inspected, and a small hole was identified, which was repaired with interrupted monofilament suture. The patient returned to the postcare unit in stable condition. The patient was discharged home on postoperative day 1 with a normal neurovascular exam in the left upper extremity. The pathology report was consistent with a pseudoaneurysm. The patient followed up in office at 1 week with palpable pulses at the left wrist. The incision was healed, and the patient had normal motion and sensation in the left hand.

**BioGlue Embolus to Popliteal Artery After Ascending Aortic Dissection Repair**

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Table. Continued.

Time to complication	Complication	Intervention	Follow-up
15 months	Aneurysm, bypass graft stenosis	1. Aneurysm exclusion with covered stents in stacking configuration 2. Covered stenting of graft stenosis	5 months No evidence of re-stenosis/aneurysm
4.5 years	Proximal anastomosis pseudoaneurysm, mid-graft aneurysm	1. Proximal pseudoaneurysm resection and reconstruction with lesser saphenous vein 2. Distal aneurysm exclusion with covered stents in stacking configuration	4 months Stent occlusion with subsequent amputation
Initial complication: 4 months	Initial Complication: Proximal aorta pseudoaneurysm	Initial Complication: Aortic endograft extension cuffs in stacking configuration	3.8 years (initial Complication)
Secondary complication: 3.5 years from time of initial complication	Secondary Complication: Distal aorta pseudoaneurysm	Secondary Complication: Modular bifurcated aortic endograft	c Persistent periaortic infection, extra-anatomic reconstruction 3 months (Secondary Complication)
4 months	Left cryovein iliac limb to left ureter fistula	Covered stent to iliac limb	Persistent periaortic infection, extra-anatomic reconstruction 8 months Persistent UTI. Stent removed and replaced with interposition cryopreserved saphenous vein at time of rectal cancer resection
5.5 years	Aneurysm	Covered stent in stacking configuration	10 months No evidence of stenosis/aneurysm

**Objectives:** BioGlue embolization is a rare complication of ascending aortic dissection repair. We report a case of a BioGlue embolus causing critical limb ischemia 2 months after ascending aortic dissection repair.

**Case Study:** A 52-year-old man presented to vascular clinic 2 months after ascending aortic dissection repair and a left to right femoral-femoral (fem-fem) bypass done at an outside hospital, complaining of 3-day history of numbness and pain in the left lower extremity. Exam revealed good femoral pulses but no left popliteal or pedal pulses. The etiology of the ischemia was thought to be thromboembolism from the fem-fem bypass due to competitive flow, since a prior computed tomography (CT) done a month earlier had shown widely patent iliacs with the left, inflow side of the fem-fem that was actually perfused by the false lumen. A repeat CT angiogram now showed no thrombus in the fem-fem bypass, but a occlusion of the left popliteal artery. Plans were made for disconnection of the fem-fem and a left popliteal embolectomy via the left common femoral artery. Embolectomy recovered several large 3- to 4-mm diameter by 20- to 30-mm long pieces of hard, light brown, slightly translucent material confirmed to be BioGlue by histological analysis. On review, the repeat CT angiogram of the chest demonstrated no change in the repair of the aorta, but there was resolution of a thin, midlumen filling defect in the false lumen of the descending thoracic aorta seen on prior CT. Patient was discharged home in 2 days and continued to do well at 6-month follow-up.

**Conclusions:** Several studies advocate routine use of BioGlue for ascending aortic dissection repair. Its use is widely accepted since US Food and Drug Administration approval as an adjunct to surgical repair of aortic dissection. Numerous complications associated with BioGlue use have been seen, including embolization. This infrequent complication may very easily be misdiagnosed, leading to delay in appropriate treatment. Hence, embolization of the BioGlue should be considered as possible etiology for any end-organ ischemia in a patient who has BioGlue from recent

arterial surgery. BioGlue requires embolectomy, as it would not respond well to endovascular therapy. Imaging of the site of repair at which the BioGlue originated should also be considered.

#### A Novel Snorkel Approach for Management of Horseshoe Kidney During EVAR

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**Objectives:** Horseshoe kidneys are associated with a high incidence of aberrant renal vasculature and pose a unique challenge to repairing an abdominal aortic aneurysm (AAA). Traditional approaches can be associated with disruption of either the collecting system or even to the blood supply itself. Here, we present a novel snorkel technique for managing this condition.

**Methods:** During imaging for a urologic complaint, a 61-year-old male was found to have a 5.8 × 6.3 cm AAA as well as a horseshoe kidney. He underwent an angiogram to further delineate the blood supply to the renal isthmus, which revealed a single right renal artery, two main renal arteries on the left, and a very large inferior mesenteric artery (IMA).

**Results:** The patient was felt to be at intermediate risk for an open AAA repair so the decision was made to proceed with an endovascular aneurysm repair (EVAR). We also performed a snorkel technique to preserve the IMA due to the concern that this vessel was supplying a significant portion of the renal parenchyma. Completion angiography demonstrated a well-positioned endograft without evidence of endoleak. The patient recovered uneventfully and had preserved renal function.

**Conclusions:** AAA associated with horseshoe kidneys present a challenge to repair while also preserving renal parenchyma and arterial supply. A growing experience with snorkel techniques allows for a minimally invasive approach to this complex problem.