

Aneurysmal degeneration of the superficial femoral artery after remote endarterectomy

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Superficial femoral artery reocclusion is the most common complication of remote endarterectomy with the Mollring device. We present the first reported case of a male patient who developed aneurysmal degeneration of the superficial femoral artery after a previous left common femoral endarterectomy and superficial femoral remote endarterectomy with popliteal stenting. He underwent thrombolysis with subsequent percutaneous transluminal angioplasty after developing acute left lower extremity ischemia. At 12-month follow-up, he was free of claudication symptoms. This case illustrates the need for close surveillance and discusses possible treatment options for patients with this rare complication. (*J Vasc Surg* 2012;55:1153-5.)

Remote endarterectomy with the Mollring device is a less invasive method for revascularization of complete occlusions of the superficial femoral artery (SFA). However, this procedure may be complicated by reocclusion. We present the first reported case of aneurysmal degeneration of the SFA after common femoral endarterectomy and superficial femoral remote endarterectomy with popliteal stenting.

CASE REPORT

A 73-year-old male, with a past medical history of severe coronary artery disease and atrial fibrillation requiring warfarin, underwent a left common femoral artery endarterectomy and remote superficial femoral artery endarterectomy (RSFAE) with popliteal stenting at an outside institution in 2004. Of note, he had no prior history or family history of aneurysmal disease. He was referred to us in 2010 for aneurysmal degeneration of the SFA, at which time he denied any symptoms of claudication. Computed tomography scan showed a maximum diameter of 2.3 cm (Fig 1). This was stable compared with a previous duplex ultrasound, and he was therefore followed nonoperatively.

Later that year, he presented with acute left lower extremity ischemia. Angiography demonstrated occlusion of the left common femoral, profunda femoris, and SFAs with reconstitution of the below-knee popliteal artery (Fig 2). He underwent catheter-directed thrombolysis over a period of 48 hours. Repeat angiography demonstrated a high-grade stenosis of the left common femoral artery (Fig 3). Due to his severe heart disease and the postendarterectomy nature of this stenosis, we elected to perform

percutaneous transluminal angioplasty with a 6-mm balloon, followed by an 8-mm balloon. Postoperative duplex ultrasound of the left common femoral artery showed a peak systolic velocity (PSV) of 214 cm/s. The left-sided ankle-brachial index (ABI) was 1.03. He was discharged on warfarin and aspirin. At 12-month follow-up, he was doing well without any symptoms of claudication. His left-sided ABI was 1.06, and common femoral artery PSV was stable at 250 cm/s. The maximum diameter of the SFA was 2.3 cm.

DISCUSSION

The treatment of femoropopliteal occlusive disease has changed dramatically over the past 15 years. Femoropopliteal bypass with autogenous conduit remains the gold standard treatment, especially in patients with a life expectancy >2 years.¹ However, there is a significant increase in morbidity and mortality associated with infrainguinal bypass surgery in our aging, more dependent population.² This has led some centers to transition to an “endovascular-first” approach.^{3,4}

Outcomes after open surgical revascularization depend on lesion anatomy and conduit availability. While the TransAtlantic Inter-Society Consensus (TASC) II working group recommended open bypass with autogenous conduit as the treatment of choice for TASC D lesions,⁵ the patency of prosthetic femoropopliteal bypasses may not be superior to endovascular revascularization.⁶

In 1995, Ho et al introduced RSFAE as a less invasive femoropopliteal revascularization procedure that was met with enthusiasm because it required only one small groin incision, preserved the saphenous vein for subsequent peripheral reconstructions or cardiac procedures, and, unlike open bypass, avoided implanting prosthetic material.⁷ This procedure could be combined with open common femoral endarterectomy, and early studies found reduced length of stay and comparable assisted patency compared with open bypass.^{8,9}

A systematic review of the 19 nonrandomized case series of RSFAE found primary patency rates of 77% and 57% at 2 and 5 years, respectively.¹⁰ Recurrent stenoses occurred in almost 50% of patients, the majority within the

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Competition of interest: none.

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The editors and reviewers of this article have no relevant financial relationships to disclose per the JVS policy that requires reviewers to decline review of any manuscript for which they may have a competition of interest.

0741-5214/\$36.00

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doi:10.1016/j.jvs.2011.12.044



Fig 1. Computed tomography angiogram (A) of the abdomen, pelvis, and lower extremities reveals aneurysmal degeneration of the left superficial femoral artery (SFA) status post common femoral endarterectomy, superficial femoral remote endarterectomy, and popliteal stenting (arrows). Note the preserved runoff only seen on delayed imaging (B).

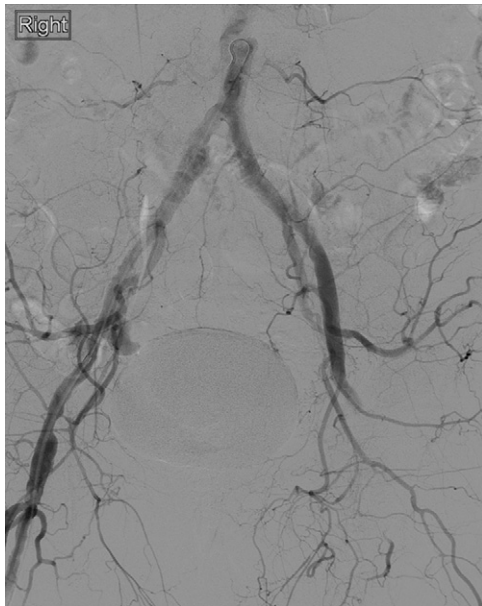


Fig 2. Initial pelvic angiogram showing complete occlusion of the left common femoral artery, profunda femoris artery, and superficial femoral artery (SFA).

first year.¹¹ Proponents of RSFAE stress that lifelong surveillance and early revision of recurrent stenoses is mandatory and can lead to assisted-primary patency rates of 77% and 50% at 2 and 5 years, respectively.^{10,12} However,

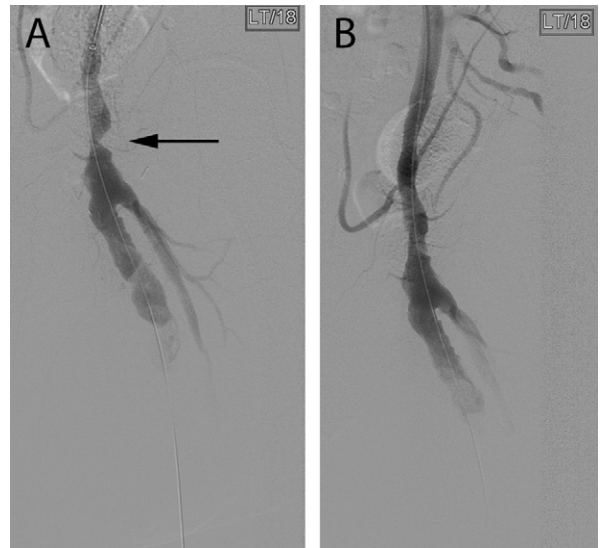


Fig 3. Postthrombolysis angiography (A) showing wide patency of the left external iliac and profunda femoris arteries, with a high-grade stenosis of the common femoral artery (arrow). Post-angioplasty image (B) shows a widely patent common femoral artery. The superficial femoral artery (SFA) is patent and aneurysmal.

Galland et al showed that the cost of maintaining patency following RSFAE was nearly five times the cost of the same for in situ bypass.¹³ With that taken into consideration, the reduced cost of shorter hospital stay associated with this less invasive repair is offset by the costly efforts to maintain patency postoperatively.

While restenosis of the SFA is the most common complication after RSFAE, there are no reports in the literature to date of aneurysmal degeneration of the SFA and thus no available guidelines for treatment. We present this case to highlight this unusual complication and describe our management. The most likely etiology of aneurysmal degeneration in this patient is that the endarterectomy plane at the time of the original surgery was too thin, leading to subsequent degeneration. It is impossible to confirm this, however, because pathology slides were unavailable. A genetic aneurysmal predisposition is less likely, as the patient had no past medical or family history of aneurysmal disease.

Initially, we chose to follow the patient because he was asymptomatic, and computed tomography scan demonstrated that the aneurysm was stable in size. In the presence of an expanding aneurysm, surgical intervention should be indicated. Given significant cardiopulmonary comorbidity and lack of suitable autologous vein due to coronary bypass, a conservative posture was taken on repair of the extensive aneurysm. Other treatment options include femoropopliteal bypass or covered stenting. While we did consider endovascular covered stenting of the SFA aneurysm, this was a technically poor option for two reasons. First, there was an inadequate proximal seal zone. Second, in order to obtain an adequate distal seal zone, we would have had to

cover all the way into the midbelow-knee popliteal artery, thus increasing the risk of stent thrombosis secondary to knee joint flexion.

When the patient presented later that year with acute ischemia, it was unclear if the cause was thromboembolism of the SFA aneurysm, thrombosis of the popliteal stent, or restenosis of the common femoral artery. Based on the fact that blood flow was not preserved through the common femoral and profunda femoris arteries, restenosis of the common femoral artery seemed the most likely. This was confirmed on postthrombolysis angiography. And while common femoral angioplasty is controversial as a primary treatment, it is associated with acceptable limb salvage rates, especially with preserved runoff.¹⁴

In conclusion, this is the first reported case of SFA aneurysmal degeneration after RSFAE. Close follow-up is mandatory because the risk of distal thromboembolism, and less likely aneurysm rupture, is undefined.

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Submitted Oct 25, 2011; accepted Dec 20, 2011.