Percutaneous Endovascular Repair of a Distal SFA Aneurysm

This technique offers a relatively simple solution to a rare clinical presentation.

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Femoral artery aneurysms are generally uncommon. The most common segment of the femoral artery that is involved in aneurysmal changes is at the common femoral artery. The presence of profunda and superficial femoral artery (SFA) aneurysms is rare, and there are only isolated case reports. Superficial femoral artery aneurysms are often treated like popliteal artery aneurysms because they can both present with limb-threatening ischemia, distal embolization, and most rarely, rupture.[1]

In a recent literature review, 61 cases of SFA aneurysms were identified.[2] This review included one patient who presented with ruptured SFA aneurysms and was treated endovascularly with a Viabahn endoprosthesis (W. L. Gore & Associates, Flagstaff, AZ). Another two cases were treated with polytetrafluoroethylene endoluminal customized grafts. The surgical treatment of SFA aneurysms included in this review entailed excision of the aneurysms and an interposition graft; other options included aneurysmectomy, bypass ligation, and femoropopliteal bypass.[2]

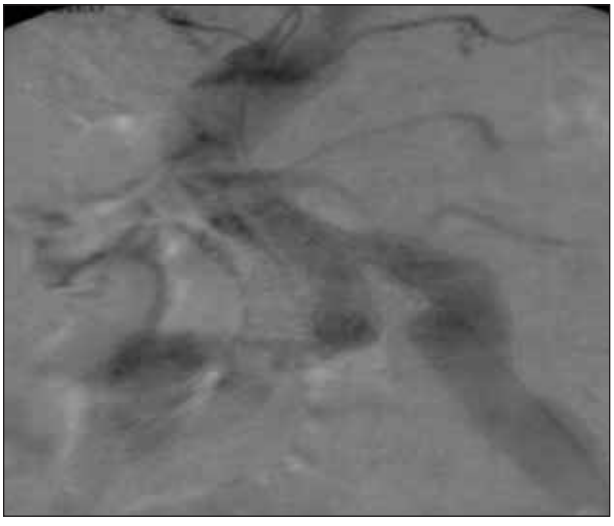

Figure 1. Aortoiliac angiogram with significant iliac tortuosity.

> "In the presence of aneurysms involving the distal SFA, endovascular repair should be strongly considered."

Today, the Viabahn endoprosthesis is an equivalent alternative to a femoropopliteal bypass in patients with suitable anatomy for endovascular repair.[3] The use of stent grafts in peripheral aneurysms offers the advantage of aneurysm exclusion and the creation of an endoluminal bypass. In this article, we describe a case report of a patient with a distal superficial artery aneurysm who was treated with percutaneous endovascular repair.

CASE REPORT

An 83-year-old man presented with pain and swelling of his right lower extremity. He has a medical history significant for aortic insufficiency, hypertension, and previous coronary artery bypass grafting and aortic valve replacement. On examination, the patient had a palpable right femoral pulse, prominent popliteal artery pulse with no palpable mass, and dorsalis pedis and posterior tibial pulses that were detected via Doppler ultrasound. A primary care physician referred the patient for a venous duplex ultrasound to rule out deep vein thrombosis. No deep vein thrombosis was identi-

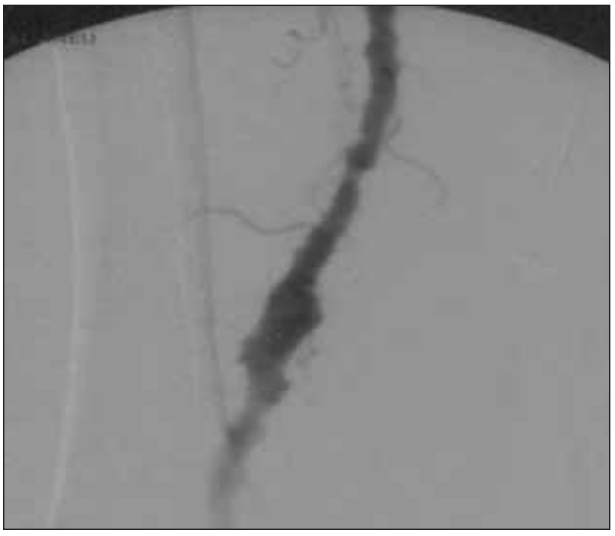

Figure 2. Distal SFA aneurysm.

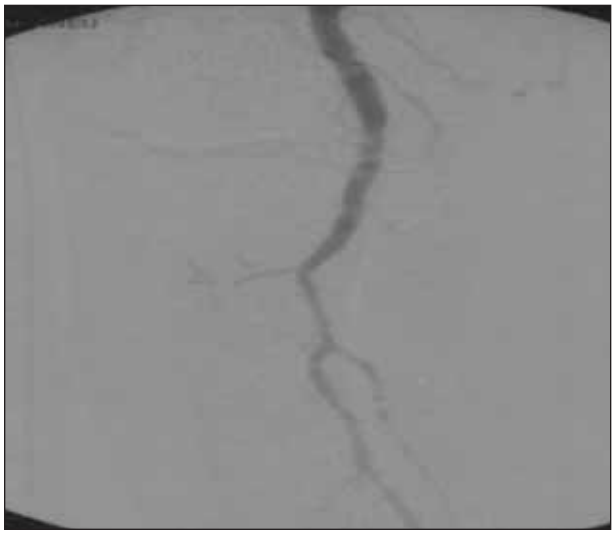

Figure 3. Right lower extremity with two-vessel runoff.

fied, but the presence of an SFA aneurysm measuring 4.5 cm was noted, and it was decided that the aneurysm should be repaired.

Arterial access was achieved with a 5-F micropuncture kit (AngioDynamics, Inc., Queensbury, NY) via the left common femoral artery. Diagnostic arteriography confirmed very tortuous iliac arteries that were successfully negotiated (Figure 1). A 5-F Flexor Check-Flo introducer sheath (Cook Medical, Bloomington, IN) was placed in the common femoral artery, and right lower extremity angiography was performed. This confirmed the preoperative finding of a distal SFA aneurysm with two-vessel runoff to the foot (Figures 2 and 3).

The aneurysm was successfully crossed with a 0.035-inch hydrophilic guidewire (Glidewire, Terumo Interventional Systems, Somerset, NJ), and a hydrophilic catheter (Glidecath, Terumo Interventional Systems) was passed over the hydrophilic guidewire. The hydrophilic guidewire was then exchanged for a stiff guidewire (Amplatz, Boston Scientific Corporation, Natick, MA).

We measured the aneurysm segment and decided to proceed with stent graft coverage. We exchanged the 5-F sheath for an 8-F Flexor Check-Flo introducer sheath and proceeded to deploy two overlapping 7- X 150-mm and 7- X 50-mm Viabahn endoprostheses. The endoprostheses were postdilated with an 8- X 100-mm Admiral Xtreme balloon (Medtronic Invatec, Frauenfeld, Switzerland), with an excellent angiographic result and preservation of the runoff (Figures 4 and 5). Successful vessel closure of the access site was achieved with a 6/7-F Mynx device (AccessClosure, Inc., Mountain View, CA). The patient was placed on aspirin and clopidogrel, admitted to a regular surgical floor, and discharged home the next day.

DISCUSSION

The Gore Viabahn endoprosthesis is covered with nitinol and polytetrafluoroethylene and has a track record for successful revascularization of the femoropopliteal arterial segments.[3] An experience has also been reported for use in a series of endovascular repairs of popliteal artery aneurysms, with inferior outcomes compared to open repairs, which is in part due to the fact that most cases of popliteal artery aneurysms have limited outflow.[4]

Our case was performed in the operating room due to the possibility of the patient needing a bypass or exclusion of the aneurysm. We decided on a contralateral approach because it facilitates the trackability and delivery of stent grafts.

The patient had two-vessel runoff that benefited an endovascular approach, as opposed to cases in which distal embolization has made the distal outflow unusable and limited the placement of the stent graft. In cases with limited distal runoff, a bypass or open approach would be the most beneficial; this does not include patients with thrombosed aneurysms who can have improvement of the outflow with thrombolysis.[5] The advantage of our case was that the distal SFA was the vessel affected. If the aneurysm had included the proximal SFA, the endovascular repair would have been limited due to the need for a 2-cm landing zone

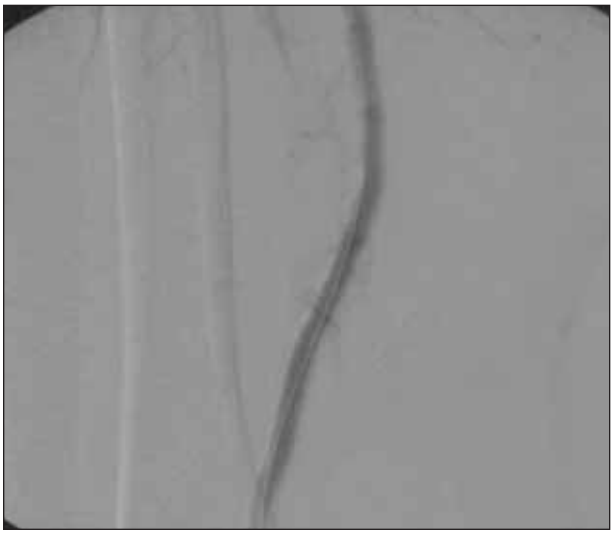

Figure 4. Postdilatation Viabahn endoprosthesis placement with successful aneurysm exclusion.

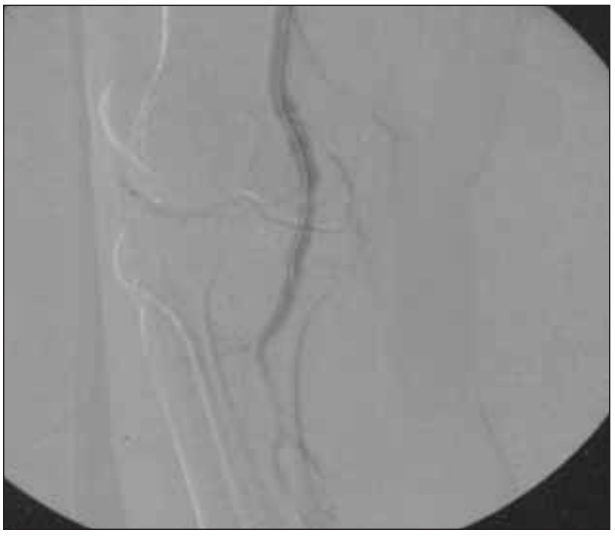

Figure 5. Distal superficial femoral artery aneurysm that was successfully excluded with a Viabahn endoprosthesis and preservation of distal two-vessel runoff.

that is required for coverage of the profunda femoral artery and common femoral artery.

Endovascular repair of popliteal artery aneurysms is limited due to type II endoleaks that persist in feeding the aneurysm sac from the genicular artery branches. The branches of the distal SFA do not have as significant branches as the genicular branches, facilitating coverage with a stent graft and decreasing the risk of a type II endoleak.[5]

Today, Viabahn is the preferred endoprosthesis for femoropopliteal arterial segments when applicable and is closely related to the Gore Excluder abdominal aortic aneurysm endoprosthesis and the Gore TAG thoracic aortic aneurysm endoprosthesis.

Although we performed the case in a totally percutaneous fashion, it took place in an operating room with endovascular capabilities due to two factors: the probable open bypass needed to correct the aneurysms and the performance of a hybrid procedure with an antegrade approach from the same side as the common femoral artery. We have previously been successful in performing access vessel closure of 8-F sheaths with a 6/7-F Mynx system, which can be an option for Mynx users with significant experience.

CONCLUSION

In the presence of aneurysms involving the distal SFA, endovascular repair should be strongly considered. Experiences with stent grafts in the SFA have proven them to be a safe option that allows the opportunity to create an endoluminal bypass. Finally, the endovascular repair of distal SFA aneurysms should be considered as an option in patients with adequate distal runoff. ■

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