Stenting of an Occlusive Femoral Artery Plaque Embolus

A case report detailing the treatment of an uncommon complication.

BY GEORGE GORDON HARTNELL, FRCR, FACC

Occlusive distal embolization is an uncommon complication of endovascular interventions. Although microscopic atheroembolization is generally thought to be common, and may even pass through collateral vessels,[1] embolization with discrete particles large enough to occlude major distal arteries are fortunately uncommon, occurring in up to 4% of patients in high-risk groups.[2] Reported approaches to treating occlusive emboli complicating endovascular procedures include aspiration or thrombolysis.[3,4] When emboli are too large for aspiration, or are due to fragments of atheroma, the conventional approach is to perform balloon embolectomy. Although balloon embolectomy has established a proven record over many years, it has limitations. Surgical exposure of the access artery is required, but may not be immediately available, allowing the propagation of thrombus into the distal vessels. Many surgeons perform balloon embolectomy under general anesthesia. In addition, when there is significant occlusive disease in the affected artery, passage of the embolectomy balloon may be difficult or unsuccessful. This article describes a case report of an alternative endovascular approach that, surprisingly, does not seem to have been reported previously.

CASE REPORT

A 67-year-old man presented with severe bilateral claudication. His exercise tolerance was less than one block. On examination, his femoral pulses were diminished and the pulses in both feet could only be detected using Doppler. MRA suggested bilateral common iliac artery stenosis and multiple left superficial femoral artery (SFA) stenoses. He was referred for endovascular treatment.

Arterial access was established via both common femoral arteries. Diagnostic arteriography confirmed the findings at MRA. The iliac artery stenoses were very irregular and were heavily calcified. There were three severe left SFA stenoses (Figure 1). The iliac artery stenoses, which were associated with significant pressure gradients, were treated with bilateral kissing self-expanding stents (Smart stent; Cordis Corporation, a Johnson & Johnson company, Miami, FL), with an excellent result. After reversing access at the left femoral puncture site using a standard technique,[5] a contrast arteriogram showed virtually no flow in the left SFA (Figure 2A). Fluoroscopy suggested occlusion of the most proximal stenosis by a calcified embolus (Figure 2B), presumably dislodged at the time of iliac artery stenting.

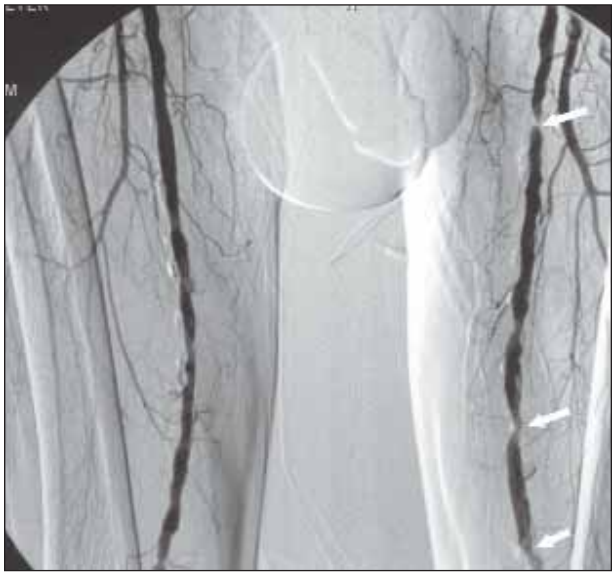

Figure 1. Image from initial digital subtraction arteriogram (DSA) showing three left SFA stenoses (arrows).

Aspiration was attempted but was unsuccessful. In view of the calcified nature of the presumed plaque embolus, it was believed that mechanical or pharmacologic thrombolysis

would be unsuccessful. Attempts were made to pass a guidewire past the lesion (Figure 2C), which was successfully completed with some difficulty using a hydrophilic guidewire (Glidewire; Terumo Medical Corporation, Somerset, NJ). Vigorous attempts to pass a 4-F, hockey-stick–shaped diagnostic catheter (Glidecath; Terumo Medical Corporation) to allow exchange for a conventional guidewire for further intervention were unsuccessful. A 4-mm X 2-cm balloon (Opta LP; Cordis) was passed across the occluded segment, and dilatation was performed. Contrast material was injected distal to the lesion after balloon dilatation, and patency of the distal vessel was confirmed. An .018-inch guidewire was advanced through the balloon into the popliteal artery. The embolus was then trapped at the site of the treated stenosis by deployment of a balloon-expandable stent (Express LD; Boston Scientific Corporation, Natick, MA) inflated to 5.3 mm.

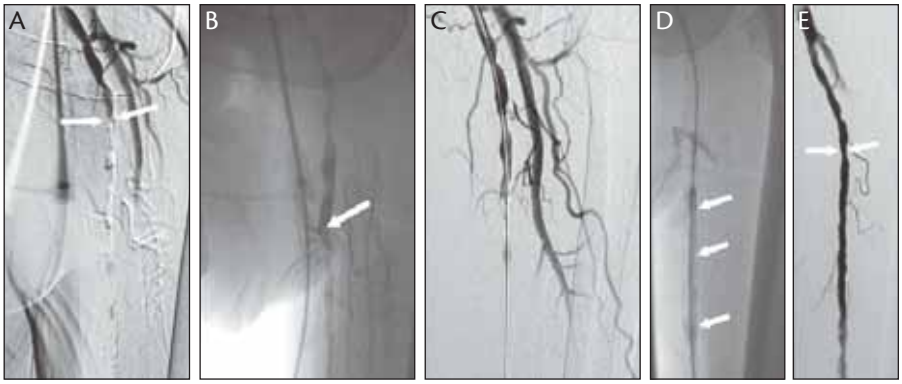

Figure 2. Digital subtraction angiography (DSA) image after accessing left SFA showing occlusion (between arrows) at the level of the most proximal stenosis (A). Unsubtracted digital image showing embolus (arrow) projecting into the left SFA (B). DSA image after crossing the left SFA occlusion with a Glidewire with no flow distally (C). Unsubtracted digital image with contrast injection through the angioplasty balloon confirming patent SFA (arrows) beyond the occlusion (D). Completion DSA image shows patent SFA at the level of the stent (between arrows) (E).

The more distal stenoses were treated with balloon angioplasty with good effect. The final angiographic result was good (Figure 2E). Imaging of the tibial arteries showed no change from the initial diagnostic arteriogram. In particular, there was no angiographic evidence of distal embolization. The patient was discharged home later that day with palpable pulses in his left foot. There were no skin changes to suggest significant atheroemboli.

DISCUSSION

In view of the eccentric, calcified, and irregular nature of the left common iliac stenosis treated by stenting, embolization was perhaps not totally unexpected, it is just surprising it does not happen more often with this sort of lesion. Conventional wisdom recommends treating plaque embolization, whether complicating endovascular or open surgical revascularization, with balloon embolectomy. In this case, this would probably have been unsuccessful given the apparent impaction of the embolus on a severe pre-existing stenosis. It is likely that passage of a Fogarty balloon (Edwards Lifesciences, Irvine, CA) would have been unsuccessful and could have caused more arterial damage. Thrombolysis is ineffective in treating plaque embolization, and aspiration was unsuccessful. Deployment of a balloon-expandable stent allowed simultaneous exclusion of the embolus and treatment of the adjacent stenosis through the same access and allowed completion of the endovascular procedure with no further problems. Rapid restoration of flow into the distal vessel prevented propagation of thrombus distally.

CONCLUSION

To our knowledge, treatment of plaque embolization in this way has not been reported previously. Exclusion of an occlusive plaque embolus by stenting is a rapid means to restore flow, allows completion of the revascularization, and avoids the need for an open surgical procedure. ■

George Gordon Hartnell, FRCR, FACC, is the Director of Cardiovascular and Interventional Radiology, Professor of Radiology, Tufts University School of Medicine, Department of Radiology, Baystate Medical Center, Springfield, Massachusetts. He has disclosed that he holds no financial interest in any product or manufacturer mentioned herein. Dr. Hartnell may be reached at (413) 794-3954; gandjhartnell@comcast.net.

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