Case Study: S.M.A.R.T.® Stent System

The Cordis S.M.A.R.T.® Stent is a valuable tool in the management of peripheral artery disease.

BY KOUSTA I. FOTEH, MD

A 70-year-old man with a past medical history of endovascular abdominal aortic aneurysm (AAA) repair, peripheral artery disease (PAD), hyperlipidemia, and hypertension presented with severe lifestyle-limiting claudication of his left lower extremity after walking 25 yards. The patient was an active retiree and a one-pack-per-day smoker. He reported that he was unable to enjoy his activities because of his limited ability to walk. Pain occured in his calf when walking and was described as a cramping pain that relieves with rest. Duplex ultrasound examination revealed an occluded left superficial femoral artery (SFA) with three-vessel runoff. His ankle-brachial index (ABI) of the left leg was 0.6. His right leg showed moderate disease with an ABI of 0.81. We discussed a couple of treatment options for this patient, including best medical therapy versus endovascular intervention. The patient did not want to entertain medical therapy because he refused to quit smoking and therefore elected to proceed with intervention. He was taken to the hybrid operating room for an angiogram with likely intervention.

TREATMENT OPTIONS

Given that the patient had a prior endograft repair of an AAA, intervention via contralateral access was not possible. We did consider an antegrade approach, but in situations such as these, we find ultrasound-guided retrograde popliteal access to be a simple and feasible approach. In the case of ostial lesions, antegrade access can be difficult when trying to guide your sheath into the origin of the SFA. Retrograde popliteal access, in many circumstances, gives you more working room and a "straight shot" to the SFA.

COURSE OF TREATMENT

The patient was placed on the table in a prone position, and his left popliteal fossa was prepped and draped in a sterile fashion. The ultrasound probe was positioned slightly cephalad to the popliteal crease. The skin and soft tissues were anesthetized with 1% lidocaine, and the popliteal artery was accessed with an 18-gauge introducer needle. A 6-F sheath (Terumo Interventional Systems) was placed via the standard Seldinger technique. A retrograde angiogram was obtained, revealing an occluded

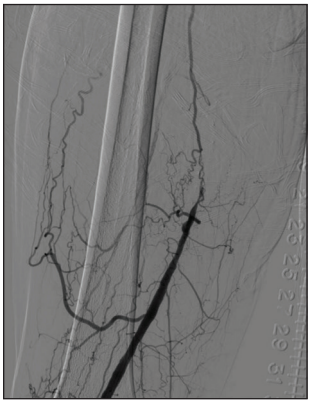

Figure 1. Access via the retrograde popliteal approach revealing an occluded SFA.

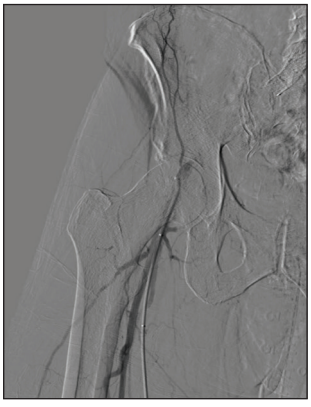

Figure 2. Catheter injection above the CTO to confirm intraluminal access above the occlusion.

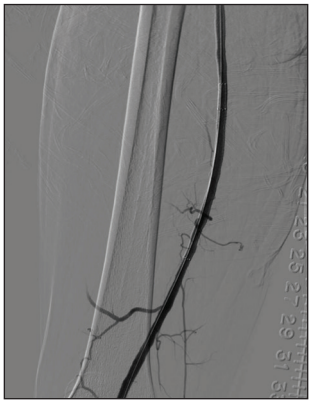

Figure 3. Angiogram after stent deployment and dilation.

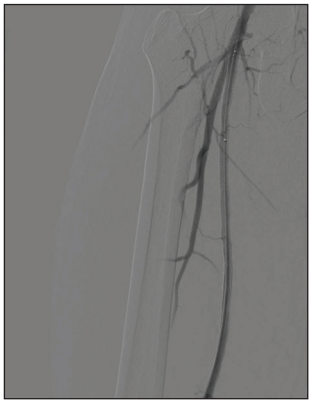

Figure 4. Angiogram after stent deployment and dilation.

SFA (Figure 1). The SFA reconstituted at the adductor canal via the collaterals. Intravenous heparin was administered, and we used a 0.035-inch stiff, angled Glidewire® and 0.035-inch NaviCross® catheter (both from Terumo Interventional Systems) to traverse the occlusion (Figure 2). Once we crossed the lesion, we estimated it to be 22 cm in length (TASC II C). A ViperWire® (Cardiovascular Systems, Inc.) was advanced via the support catheter to perform orbital atherectomy, followed by balloon angioplasty with a 6- X 120-mm Chocolate® Balloon (manufactured by TriReme Medical, LLC, distributed by Cordis Corporation). Two serial inflations of the Chocolate® Balloon were performed for 2 minutes at nominal pressure. For all chronic total occlusions (CTOs) of this caliber, when we anticipate we will be using stents, we prefer to predilate the artery with the Chocolate® Balloon. We find this balloon to be a valuable tool in the management of CTOs, whether in use as a stand-alone therapy or paired with stenting, as the Chocolate® Balloon has shown superior stent-to-artery wall apposition after predilation. At this point, the decision was made to stent the SFA (Figure 3). We used one 6- X 150-mm and one 6- X 120-mm S.M.A.R.T.® Stent (Cordis Corporation) with at least 1 cm of overlap. We postdilated it with a 6- X 220-mm Powerflex® Pro Balloon (Cordis Corporation).

RESULTS

Completion angiogram showed complete resolution of the occlusion with no residual stenosis (Figure 4). The patient tolerated the procedure well, and after his sheath was removed, he had palpable posterior tibial and dorsalis pedis artery pulses. At 1-month follow-up, the patient reported complete resolution of his claudication, and his duplex ultrasound showed a widely patent SFA with an ABI of 1.0. At 3-month follow-up, the patient continued to be free from claudication, with an ABI of 1.0.

DISCUSSION

Although there are many ways to treat CTOs of the SFA, we find the S.M.A.R.T.® Stent to be a valuable tool in the management of PAD. There are many advantages of the S.M.A.R.T.® Stent, including its radial force, that give it the ability to resist compression and maintain luminal gain. Its unique design of 36 struts with six bridges provides uniform scaffolding and small cell size. This design also provides longitudinal stability, which minimizes stretching and enhances placement accuracy. In previous studies, the S.M.A.R.T.® Stent had a primary patency rate of 81.7% at 1 year and 72.7% at 3 years, with 87.4% freedom from target lesion revascularization at 1 year and 75.8% at 3 years, as shown in the STROLL data. Most importantly, we believe it leads to superior patient outcomes. ■

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