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Endovascular treatment of a superficial femoral artery aneurysm using an Amplatzer Vascular Plug

We read with great interest a series of recently published articles in *Diagnostic and Interventional Radiology* concerning the range of Amplatzer® Vascular Plugs (AVPs, AGA Medical Corp., Golden Valley, Minnesota, USA) and their increasing applications (1–3). We would like to add our experience with choosing an AVP for the treatment of a rare superficial femoral artery (SFA) aneurysm and raise some points about selecting among the AVP 1, AVP 2, and AVP 4 devices.

An 80-year-old male with a right femoro-popliteal bypass graft presented with pain in his right thigh with a pulsatile mass lesion. A computed tomography angiogram demonstrated a 3 cm degenerative aneurysm of the native right SFA, and he was referred to the Interventional Radiology Department for embolization.

A 65 cm cross-over sheath was inserted. Selective angiography was performed with a 20° right anterior oblique projection to unfold the profunda, graft origin, and native SFA (Fig. 1a). The native SFA was accessed using a 100 cm 4 F catheter, and angiography was performed to measure the inflow vessel and to check for significant outflow vessels (Fig. 1b). The distal SFA was shown to be patent, so two 0.035 inch coils were used to embolize the “back door”. The 6 F sheath was advanced into the proximal neck of the aneurysm. The AVP was oversized by 30%, and a 16 mm AVP 2 was selected. After deployment, the position was deemed satisfactory, and the plug was released. A post-

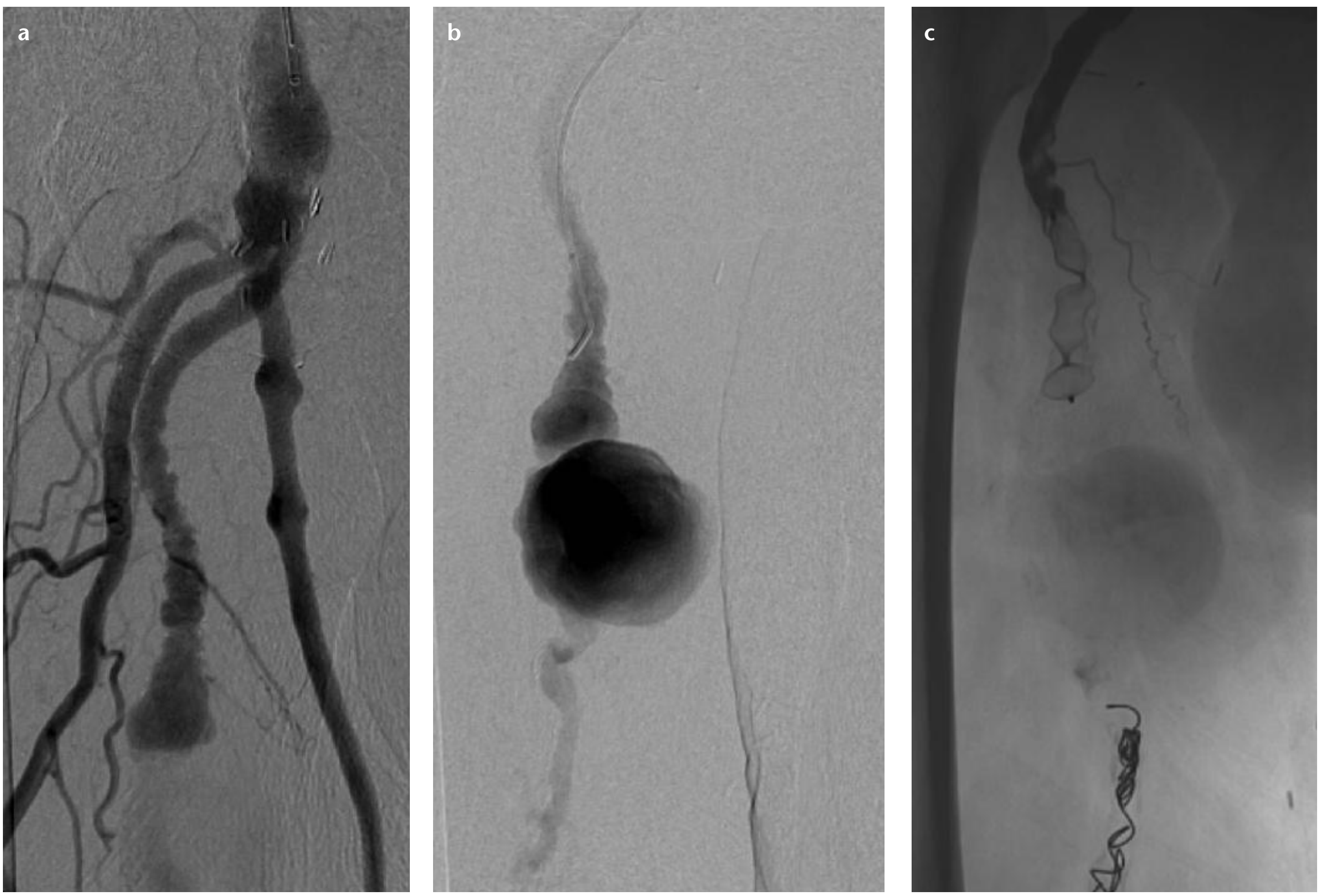

Figure 1. a–c. Angiogram from the common femoral artery **(a)** shows the native superficial femoral artery, profunda, and femoro-popliteal bypass. The degenerate native superficial femoral artery measured 10 mm immediately proximal to the neck of the aneurysm. Selective angiogram from the native superficial femoral artery **(b)** demonstrates the large aneurysm and the outflow vessel. Postembolization angiogram **(c)** shows stasis of the contrast medium in the native superficial femoral artery, occlusion of the aneurysm and the AVP 2 device in the native superficial femoral artery, and Nester coils in the outflow vessel.

deployment angiogram was performed after five minutes, demonstrating occlusion of the aneurysm (Fig. 1c). At this point, the mass in the medial thigh was noted to no longer be pulsatile. The patient was discharged without complication and examined in the clinic at six weeks and again at one year with no symptoms or evidence of recanalization.

True SFA aneurysms are rare, with only 61 cases reported to date (4) and two further case reports after that (5, 6). Traditionally, they have been treated with interposition grafting or by-pass surgery. Here, percutaneous treatment using an AVP and coils was successful and, to our knowledge, represents the first report of such a technique.

The AVP was selected because it is a versatile embolic device for use in medium-to-large vessels, and it is widely used for iliac artery embolization prior to endovascular aortic stent grafting and treatment of pulmonary arteriovenous malformations. The advantages of the AVP over coils include the ability to precisely position and reposition the device. Additionally, only a single device is required to occlude a larger vessel—whereas multiple coils are used—resulting in a decreased procedure time, radiation dose, and cost; moreover, the risk of coil migration is avoided.

There are now four generations of this device. The AVP 1 has a single segment, whereas the AVP 2 has three segments, a feature intended to improve its occlusive properties. The latter was selected in the case described by Young et al. (3) precisely for this reason. However, the AVP 1 retains the advantage over the AVP 2 of being able to be placed in a short target vessel (2).

In the present case, there was a long "landing zone" providing a sufficient length of the artery in which to place the AVP 2, which has better occlusive properties than the AVP 1. Similarly, the "back door" could have been embolized with another AVP. However, the working sheath of 65 cm was not long enough; hence, the decision was made to place two coils through a 5 F catheter. Alternatively, an AVP 4 could have been used; the advantages of this type were described by Yıldız et al. (1).

In conclusion, the present case demonstrates the usefulness of the AVP in the endovascular treatment of a rare true aneurysm of the SFA.

Conflict of interest disclosure

The authors declared no conflicts of interest.

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