

 **Case Report** 

A Ruptured Popliteal Artery Aneurysm Treated with Coil Embolization

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A popliteal artery aneurysm is one of the most common peripheral arterial aneurysms. These aneurysms can cause distal embolization and thrombosis, leading to limb loss. However, their rupture is unusual. Here we report a case in which a popliteal aneurysm with chronic occlusion at its outflow artery developed a nonfatal, painful rupture. We performed only coil embolization of the proximal artery, and the aneurysm was successfully excluded. After the procedure, collateral circulation was maintained. No ischemic symptoms such as intermittent claudication or pain at rest were observed. This approach may be useful in treating similar cases.

Keywords: ruptured popliteal artery aneurysm, coil embolization

Introduction


Popliteal artery aneurysms (PAAs) are generally complicated by thrombosis and embolization, whereas rupture is rare. We report a case of a ruptured PAA with chronic total occlusion of the distal popliteal artery treated with coil embolization.

Case Report

An 84-year-old man was referred to our hospital for a 1-month progressive history of a pulsatile, painful mass

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in his left popliteal fossa. He had a medical history of hypertension and hemodialysis, but denied any traumatic events. Although the popliteal, posterior tibial, and dorsalis pedis arteries were not palpable in either lower extremity, the patient did not experience symptoms of intermittent claudication or foot pain at rest. The preoperative ankle-brachial pressure index (ABPI) value in the left lower extremity was 0.41.

Contrast-enhanced computed tomography (CECT) revealed an aneurysm in the left popliteal artery, with evidence of rupture into the surrounding soft tissue. The distal popliteal artery was already occluded, but the peroneal, anterior, and posterior tibial arteries were patent and visualized through collateral vessels (Fig. 1).

A diagnosis of a ruptured PAA with chronic total occlusion of the distal popliteal artery was made. We assumed that surgical revascularization was unnecessary, because there were no symptoms of arterial occlusion. Considering the patient's age and the presence of comorbidities, we performed endovascular treatment under local anesthesia instead of open surgery. A 6-Fr introducer sheath was inserted percutaneously into the left common femoral artery and a 0.035-inch guidewire was passed into the left superficial femoral artery using a 5-Fr catheter. Digital subtraction angiography showed a PAA, total occlusion of the distal popliteal artery, and collateral vessels from the proximal aneurysm extending to the left lower extremity. One 15-mm coil and two 20-mm coils (MReye; Cook Medical, Bloomington, IN, USA), and three 6-mm/3-mm platinum coils and two 4-mm/3-mm platinum coils (Tornado; Cook Medical, Bloomington, IN, USA) were used to embolize the proximal artery feeding the aneurysm. Digital subtraction angiography after embolization demonstrated the absence of blood flow into the aneurysm. The collateral vessels were maintained (Fig. 2). As a result, the aneurysm was fully thrombosed, and gradually shrank in a few days after the surgery. The patient's post-procedural course was uneventful and the postoperative ABPI value in the left lower extremity was 0.49. The limb was viable and the patient was ambulant at discharge after 6 postoperative days. CECT after treatment showed tibial arteries through collateral vessels (Fig. 3).

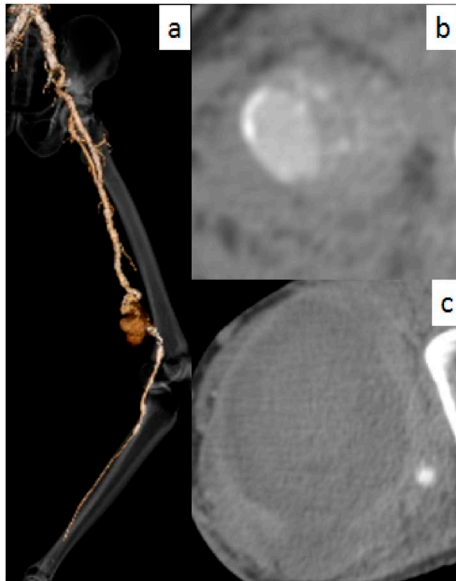


Fig. 1 (a) Three-dimensional computed tomography (CT) shows an aneurysm of the left popliteal artery. (b) CT demonstrates the presence of a true aneurysm. (c) CT reveals a hematoma into the surrounding soft tissue.

Discussion

While PAAs are rather rare in the general population, they are the most common peripheral artery aneurysms, accounting for at least 70% of cases.¹⁾ Lower extremity ischemia is the most common presenting symptom and is usually secondary to embolization or thrombosis. In contrast to abdominal aortic aneurysms, rupture in PAAs is an unusual complication reported at a rate of 0% to 7% in published series.²⁾ It is generally accepted that all symptomatic PAAs and those measuring 2.0 cm or more in diameter should be considered for treatment.³⁾ Surgical reconstruction is typically recommended to avoid ischemic complications. Recently, endovascular repair with stent grafts and covered stents has been reported as a possible alternative to open surgery.

Historically, however, John Hunter reported in 1786 that he performed ligation of the popliteal artery of a patient with a large PAA in the canal that now bears his name. Hunter emphasized that collateral circulation would maintain the viability of the limb.⁴⁾ In 1906, Matas reported that he treated PAAs without reconstruction, solely by ligating all vessels entering and exiting the aneurysms.⁵⁾

Recent studies have reported that endovascular treatment with vascular plugs or coils is useful for artery embolization.⁶⁾ In our presenting case, percutaneous treatment using coils to embolize the proximal artery of the aneurysm was successful. Reconstruction was not necessary because the distal popliteal artery was already

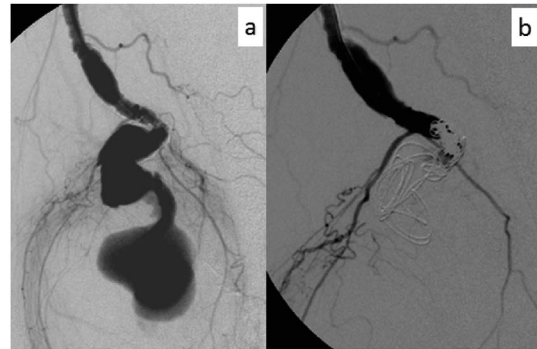


Fig. 2 (a) Selective angiogram of the left popliteal artery shows an aneurysm. The collateral vessels are easily visible. (b) Post-embolization angiogram shows the absence of blood flow into the aneurysm. There are no changes in the collateral vessels.



Fig. 3 Contrast-enhanced computed tomography after endovascular coiling does not show coil migration (a), reveals shrinkage of hematoma (b), and demonstrates tibial arteries through collateral vessels (c).

occluded and the patient had not complained of ischemic symptoms. Popliteal artery is well-known for non-stenting zone, and little information is available on the application of endovascular coiling to the joint region. However, in this case, the physical activity level of the patient was low. Our presenting patient requires careful long-term follow-up because of the possibility of coil migration requiring re-canalization.⁷⁾

Conclusion

We report a case of successful coil embolization for ruptured PAA with chronic occlusion. This case is unusual because the patient did not require revascularization due to adequate collateral blood flow. This approach may be a therapeutic option in similar cases.

Disclosure Statement

The authors have no conflicts of interest to disclose.

Author Contributions

Study conception: YK

Writing: YK, MM

Critical review and revision: all authors

Final approval of the article: all authors

Accountability for all aspects of the work: all authors

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