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Case Report

Thrombosis of popliteal artery aneurysm with cutaneous microembolism of toes

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ABSTRACT

Popliteal artery aneurysms (PAAs) are rare, and usually affect men over 60 years of age with established cardiovascular disease due to atherosclerosis. They can also be congenital or can occur due to trauma, mycotic aneurysm, popliteal entrapment or inflammatory arteritis. This is a case of a 95 year old male, with history of recent subdural hematoma, who presented with acute onset right lower limb pain and edema. He was found to have right PAA with thrombosis which was throwing cutaneous microemboli to the toes. He underwent open aneurysm repair with Dacron graft and thrombectomy and improved.

Keywords: Popliteal artery aneurysms, Peripheral arterial aneurysms, Cutaneous microembolism

INTRODUCTION

Popliteal artery aneurysms (PAAs) are rare, with an incidence rate of less than 0.1%. They account for about 70% of all peripheral aneurysms.[1] The condition is commonly seen among men over 60 years of age with cardiovascular disease. These patients usually have associated contralateral PAAs and/or abdominal aortic aneurysms.[2] It is usually caused by atherosclerosis; other uncommon conditions include trauma, congenital PAA, popliteal entrapment, mycotic aneurysm or inflammatory arteritis.[3] PAAs, especially large ones, can be a therapeutic challenge. The situation we faced was a PAA with thrombus, throwing cutaneous microemboli, in a 95 year old man with history of subdural hematoma few months ago.

CASE REPORT

A 95 year old male presented to Medicine Department with acute onset right lower limb pain with associated edema since 1 week. The pain was mainly around the knee joint. He was on telmisartan (40 mg once daily) and atorvastatin (20 mg at night) for hypertension and dyslipidemia respectively. He had history of fall 2 months ago resulting in right subdural hematoma and had undergone Burr hole surgery.

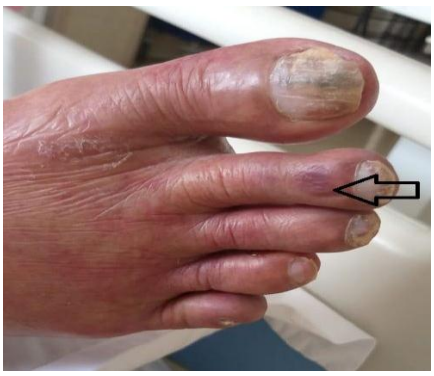

Figure 1: Edematous right foot with cutaneous microemboli.

On examination, he was conscious, oriented and afebrile. His vitals and systemic examinations were normal. He had swelling of right lower limb from knee to foot, with

bluish spots over toes (Figure 1). He had a tender non-pulsatile mass in the right popliteal fossa. All peripheral pulses were felt. His blood investigations like complete blood count, renal and liver functions, electrolytes, HbA1c, TSH and lipid profile were normal. Antinuclear antibody profile, anti-cyclic citrullinated peptide and antineutrophil cytoplasmic antibodies (p and c) were negative. Fasting lipid profile was normal with LDL 86 mg/dL, HDL 52 mg/dL, VLDL 15 mg/dL and triglycerides 121 mg/dL. Arterial Doppler of right lower limb showed atheromatous peripheral arterial disease with thrombosis of fusiform PAA. Venous Doppler was normal with no deep vein thrombosis. Computed tomography (CT) peripheral angiogram revealed a fusiform right PAA (6.2 cm in length) extending superiorly from a point approximately 11 mm proximal to the knee joint line and caudally reaching up to the division of the popliteal artery into anterior tibial and tibioperoneal trunk. There was mild to moderate luminal narrowing of the posterior tibial artery. An eccentric mural thrombus with maximum wall to wall aneurysm dimension of 29×23 mm was seen (Figure 2 and 3). Fusiform PAA was also noted on the left side (2 cm in length) with no thrombus. There was diffuse narrowing of anterior tibial artery with good distal reformation. ECG, chest Xray, ultrasound abdomen and carotid artery Doppler were normal; and echocardiography showed concentric left ventricular hypertrophy. Diffuse atrophic and small vessel ischemic changes were seen on CT brain.

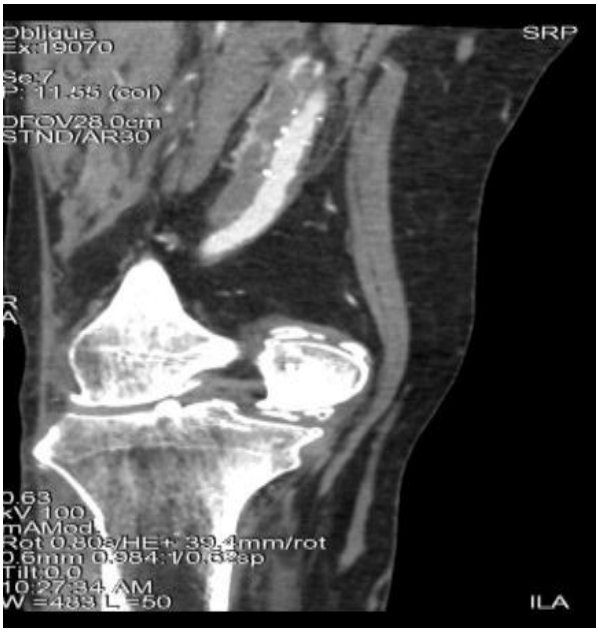

Figure 2: CT peripheral angiogram showing right fusiform popliteal artery aneurysms with mural thrombus.

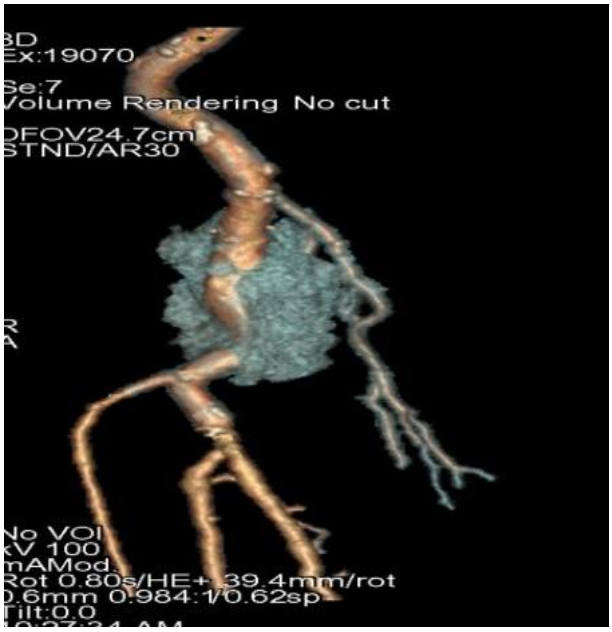

Figure 3: 3D reconstruction of CT peripheral angiogram showing right popliteal artery aneurysms.

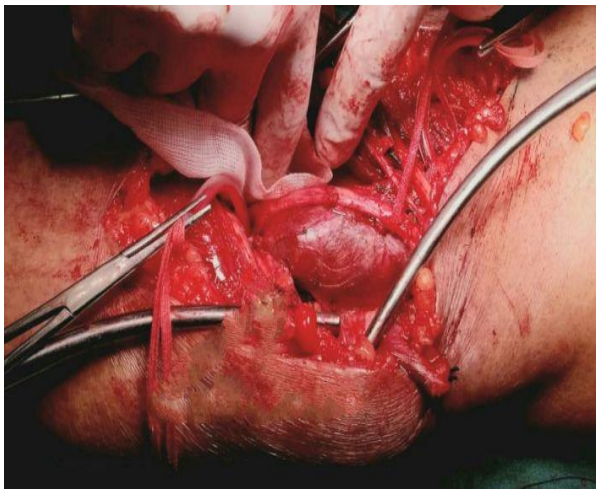

Figure 4: Right popliteal artery aneurysms intraoperatively.

Surgical procedure

Through true posterior approach using a lazy "S" incision the right PAA was exposed after dissecting out the tibial nerve and popliteal vein away from the aneurysm (Figure 4). After gaining proximal and distal control on the aneurysm, it was opened, and the thrombus was cleared from the aneurysm sac (Figure 5). Dacron inter position graft (8 mm) was used for reconstructing the popliteal artery (Figure 6). The graft was wrapped around with the aneurysm wall. The wound was closed in layers leaving behind vacuum drain.

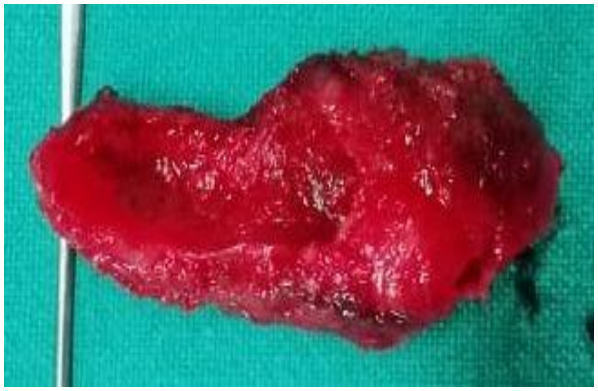

Figure 5: Thrombus removed from right popliteal artery aneurysms.

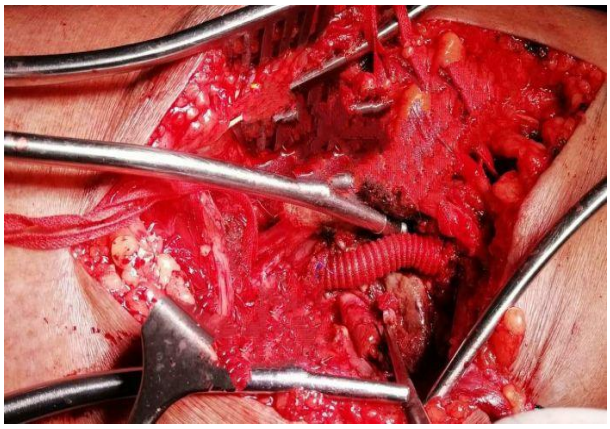

Figure 6: Revascularization with Dacron graft.

The post-operative period was uneventful, and the patient was discharged on day 10 of admission on aspirin (75 mg once daily), clopidogrel (75 mg once daily), rosuvastatin (10 mg at night) and telmisartan (40 mg once daily). Arterial Doppler of right lower limb after 1 month and 3 months showed patent popliteal lumen with stent graft in situ. The aneurysmal sac around the graft appeared collapsed with no evidence of thrombus.

DISCUSSION

PAAs involve all layers of the arterial wall, and hence considered as true aneurysms.[4] The average diameter of popliteal artery ranges from 0.5 to 1.1 cm; and PAA is defined as the enlargement of the artery to 1.5 times the average diameter. Fusiform PAA occurs due to loss of the mechanical integrity of the vessel wall, which in turn leads to dilation of the vessel and aneurysm degeneration. However, the exact mechanism for the development of PAA is unknown.[4,5] The loss of endothelial homeostasis activates the pro-inflammatory and pro-coagulant mediators, thereby leading to the formation of mural thrombus. Moreover, with the enlargement of aneurysmal sac, there will a turbulent blood flow through the lumen, resulting in clot formation; which can ultimately lead to thrombosis and/or embolism.[4,6,7] Acute thrombosis of PAA can result in acute critical limb ischemia; while repeated thromboembolic events can cause chronic ischemia and is seen in 85% of asymptomatic PAA.[8,9]

Patients may present with worsening claudication pain, rest-pain, ulceration or blue toe syndrome. A palpable mass may be felt in the popliteal fossa. CT arteriogram will enable to establish the diagnosis. Large aneurysms face the risk of thrombosis, arterial embolization and rupture. The management is based on the Rutherford classification of acute limb ischemia, which is as follows:

Grade I

Viable and not immediately threatening, with no sensory or motor deficits. The arterial and venous doppler signals are audible.

Grade II

Threatened. There are 2 subcategories: a) marginally threatened, and salvageable if promptly treated. There is minimal or no sensory and motor deficits. The arterial signal is absent but venous signal is audible; and b) immediately threatened, and salvageable with immediate revascularization. There is moderate sensory deficit with associated rest-pain and mild to moderate motor deficits. The arterial signal is absent but venous signal is audible.

Grade III

Irreversible, major tissue loss or permanent nerve damage inevitable. There is profound sensory and motor deficit. The arterial and venous signals are absent.

Patients with grade I or IIa may be treated with immediate anticoagulation; while grade IIb or III require urgent revascularization. Patients with non-viable limbs should be given therapeutic anticoagulation, and the limb should be allowed to demarcate in order to determine the level of amputation.[10] There is no clear guidelines indicating the repair of PAAs, but those with diameter greater than 2 to 3 cm, especially with a significant thrombus or with distal tibial artery embolic occlusion, is indicated for intervention.[11,12] Patients with local compression or severe claudication, rest pain, and tissue loss are considered for elective repair. The management of asymptomatic patients and those with mild to moderate claudication is under debate. Though endovascular repair is being performed more commonly, with favourable outcomes, open surgical repair remains the gold standard.[13] The open approach has greater durability and is cheaper when compared to endovascular approach.[11,14,15] Moreover, the rates of re-intervention after 30 and 90 days of initial procedure were lower in case of open surgery when compared to endovascular procedure.[14]

Cutaneous microembolisms present as intermittent painful reddish or bluish macules of the finger tips and toes.[16] Our patient was a 95 year old hypertensive man

with history of recent subdural hematoma. He had bilateral fusiform PAA, with mural thrombus in the right PAA which was throwing cutaneous microemboli. Anticoagulation was not advisable in view of subdural hematoma. He underwent right PAA repair with Dacron graft and thrombectomy by open approach. Since the left PAA was small and asymptomatic with no thrombus, PAA repair was not done. On review after 1 and 3 months, he continued to be asymptomatic, with graft in situ on arterial Doppler imaging.

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