

**Case
Report****Ruptured Deep Femoral Artery Aneurysm:
A Case Report**

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A deep femoral artery (DFA) aneurysm is a very rare pathology of the vascular system. Peripheral arterial aneurysms constitute 4.6% of all aneurysms, of which 0.13% are DFA aneurysms. In the literature, there are still few reports on this vascular system pathology. As a result, its diagnosis and treatment remain a serious clinical problem. This case study is of a 95-year-old patient admitted to our Department with anemia, swelling, and lower left leg pain. Generally, open surgery seems to be the treatment of choice for DFA aneurysms although the possibilities of intravascular therapy require further investigation.

Keywords: deep femoral artery, aneurysm, ruptured aneurysm

Introduction

Aneurysms, which are quite rarely localized in peripheral arteries, are most common in the popliteal arteries. A profunda femoris artery (PFA) aneurysm is a very rare vascular pathology. They constitute from 0.1% to 4.6% of all peripheral artery aneurysms.^{1–6)}

The incidence of PFA aneurysms is strongly correlated with the presence of aneurysms in other locations. According to the literature, 51%–85% of patients have abdominal aortic or iliac artery aneurysms and 17%–44% have popliteal artery lesions.^{1,6–8)} Isolated PFA aneurysms are very rare.^{1,9)}

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Case Report

A 95-year-old patient was brought by an emergency ambulance team to the Emergency Department due to weakness, edema, and very severe pain in the lower left limb. For about 7 days before admission, he had been suffering from a pulsating tumor in the left thigh and cooling of the lower left limb (**Fig. 1**). An ultrasound revealed a large hematoma and suggested a ruptured aneurysm of the left superficial femoral artery (SFA). A color Doppler revealed a compressed and deviated SFA. On physical examination, the pulse was palpated at the groin, behind the knee, near the ankle joint and on the foot. The ankle brachial pressure index was 0.9. The patient, with whom there was limited logical contact due to advanced dementia, had a tachycardia of 115/minute and blood pressure of 90/50 mmHg. Laboratory tests detected the following: hemoglobin level of 5.7 g/dL, d-dimer of 1.300 mcg/L, creatinine of 1.22 mg/dL, blood urea nitrogen of 10 mg/dL, creatinine clearance of 60 mL/min/1.73 m², and base excess of –1.0 mEq/L. The patient and his family said there had been no injury to the lower limb. A computed tomography (CT) angiography showed an aneurysm of the thigh measuring 14 (TR) × 11 (AP) × 33 (CC) cm and displacing the muscles. The left SFA, which was located at the periphery of the aneurysm and was partially compressed and displaced,

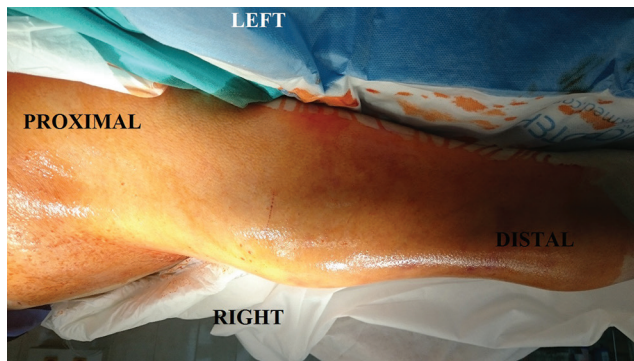


Fig. 1 Left thigh tumor, with accompanying lower limb edema caused by a ruptured DFA aneurysm. DFA: deep femoral artery

underwent poorly delayed contrast enhancement. In its upper and medial sections, the left PFA was connected with the hematoma. In the initial segment, about 1.5 cm below the division of the common femoral artery, the PFA widened to 3.5 cm. There was no visible posterior artery wall in the distal part. In addition, the patient was diagnosed with an aneurysm of the right popliteal artery which was 5 cm in diameter, an aneurysm of the aorta (5 cm) and an aneurysm of the left (4.2 cm) and right (2.5 cm) common iliac artery. The impaired perfusion of the aneurysm was due to its giant dimensions (**Fig. 2**). The diagnosis of a ruptured PFA aneurysm was made. There was no significant ischemia as the aneurysm started on the second division of the deep femoral artery (DFA). The thigh muscles were perfused by the cranial collateral arterial flow. Low-molecular-weight heparins were administered. The patient was quickly operated on. A PFA aneurysm was prepared. We found the rupture of the posterior wall of the aneurysm and a massive intramuscular hematoma. Due to the patient's health status and the operating conditions, the proximal and distal PFA sections were ligated along with numerous arteries branching off from the aneurysmal bag. A Fogarty catheter was used to control of back bleeding. Also, the whole hematoma was removed, which relieved the pressure from the SFA (**Fig. 3**). The surgery improved the blood supply to the operated limb, with a palpable pulse on the anterior tibial artery. It was necessary to intraoperatively transfuse 4 units of erythrocyte mass and 2 units of fresh frozen plasma. The pain disappeared, as did the peripheral edema of the lower left extremity. No complications were observed in the postoperative period and the patient was discharged in good general condition 6 days after surgery.



Fig. 2 CT angiography scan of left thigh. The red arrow shows the top of the giant aneurysm. CT: computed tomography

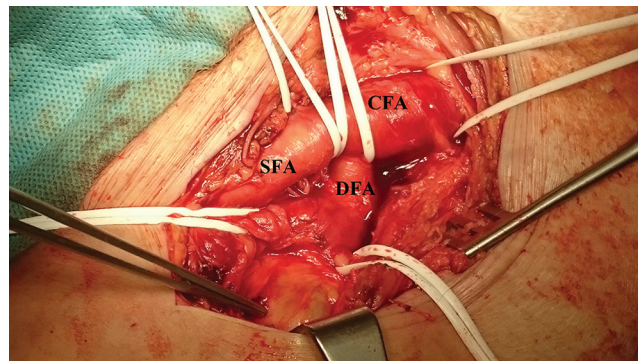


Fig. 3 Bifurcation of the common femoral artery and aneurysm of DFA. CFA: common femoral artery; SFA: superficial femoral artery; DFA: deep femoral artery

Discussion

In our case, we found a right popliteal artery aneurysm with a diameter of 4.5 cm. No other aneurysms were detected. Both our case and the literature indicate that this pathology affects men over the age of 70 years.^{10,11)}

PFA aneurysms are diagnosed based on the presence of clinical lesions such as a pulsating thigh tumor, lower limb edema, venous thrombosis, and peripheral

embolization.^{1-3,7-9,11-13}) In the event of an aneurysm rupturing, the patient may develop the symptoms of hypovolemic shock. An ultrasound examination is helpful but, in our case and according to the literature, it is not conclusive as it does not provide enough information to enable a definitive diagnosis.^{4,8}) CT angiography seems to be the most accurate diagnostic test to confirm the disease. Angiography also seems to be a good diagnostic tool, but due to the patient's condition and the results of the CT angiography, we did not perform this test.^{1,4,8,14}) It seems necessary to extend diagnostic management by examining the abdominal aorta and other arteries in the lower limbs to exclude aneurysms in other locations.^{1,7-8,14})

Morphologically, PFA aneurysms are most often caused by atherosclerotic lesions in the vascular wall.^{1,6,8,10-12}) The PFA course in the muscular canal in the thigh is the factor that makes these aneurysms rare.¹⁻⁴) Based on the literature, PFA aneurysms have a much higher tendency to rupture than other peripheral artery aneurysms. In our case, the aneurysm was ruptured.^{1,3-6,8,12}) Therefore, once the diagnosis is made, surgical treatment should be immediately implemented.

Open surgical treatment seems to be the best option for PFA aneurysms. Unfortunately, because it is a rare pathology, surgeons have limited experience in this area. Different treatments may be used depending on the anatomical conditions, the health status of the patient and the patency of the SFA. If the SFA is patent and the anatomical conditions are not satisfactory, the ligation of the PFA seems to be sufficient.^{1,5,6,10,12}) If the SFA is obstructed, it is necessary to reconstruct the PFA using the patient's own artery or a dacron vascular prosthesis as a bypass.^{1,2,6,10}) Of course, bypass implantation is always the best solution.^{1,12}) In the case of a ruptured aneurysm with a massive hematoma and the associated symptoms of hemodynamic instability, ligation of the PFA in the proximal and distal segments seems to be the most reasonable option.^{1,2,6,8,9}) It is also necessary to accurately dissect the entire aneurysm because numerous PFA branches can feed the aneurysm despite the ligation of the main trunk.⁵)

In the light of current achievements in endovascular surgery, it is possible to perform the embolization of non-ruptured PFA aneurysms.^{5,12}) However, we do not have enough reports in the literature on the minimally invasive treatment of true PFA aneurysms.^{5,12}) There are only reports on endovascular treatment of false aneurysms of the PFA. The endovascular treatment was excluded in this particular case due to the giant dimensions of the

aneurysm. What is more, such a large clotted aneurysm might promote the development of serious infection.

Conclusion

PFA aneurysms are a very rare pathology of the vascular system. The management of such an aneurysm requires the extension of the diagnostic process to examine the aorta and the arteries in the lower extremity to exclude the presence of aneurysms in other locations. In this particular case, open surgery seems to be the treatment of choice in PFA aneurysms although the possibilities of intravascular therapy require further investigation. The presence of edema and thigh ache accompanied by an acute palpable pulsating tumor should direct differential diagnosis to a PFA aneurysm. CT angiography seems to be the best diagnostic test. Ultrasonography is also valuable, but it does not always provide enough information to enable a final diagnosis.

Informed Consent

Informed consent was obtained from the individual participant included in the case report.

Disclosure Statement

The authors declare no conflicts of interest in relation to this article.

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