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Kasuistika | Case report

A rare case of multiple aneurysms in ilio-femoro-popliteal segment with rupture of deep femoral artery

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SOUHRN

Úvod: Aneurysma hluboké stehenní tepny (deep femoral artery, DFA) se vyskytuje velmi vzácně. Diagnóza se vzhledem k anatomickému uložení tepny stanovuje obtížně. Obecně se aneurysma projevuje komplikacemi – kompresí a rupturou.
Popis případu: Popisujeme případ 78letého muže, který byl urgentně přijat na oddělení cévní chirurgie a který si stěžoval na náhlou bolest a velkou pulsující hmotu ve femorálním trojúhelníku levého stehna. Vyšetření ultrazvukem a CT angiografie (CTA) potvrdily přítomnost prasklého aneurysmatu DFA s velkým hematomem vlevo. CTA prokázala aneurysmata i v obou iliackých, stehenních a lýtkových tepnách. Femoropopliteální segment byl průchodný na obou stranách. Vzhledem k závažnému přidruženému onemocnění byla provedena ligace proximálního krčku aneurysmatu a zašita prasklá stěna.
Diskuse: Aneurysmata DFA jsou velmi vzácná – jedná se 0,5 % všech aneurysmat periferních cév. Vzhledem k jejich malému průměru fyzikální vyšetření málokdy prokáže přítomnost aneurysmatu. Mezi cenné diagnostické metody patří duplexní sonografie a CTA, přičemž druhá metoda je užitečnější, protože prokáže průchodnost a uložení DFA distálně k aneurysmatu. V našem případě nám ruptura aneurysmatu a průchodnost femoropopliteálního segmentu umožnila provést prostou ligaci krčku aneurysmatu a zašití prasklé stěny bez distální rekonstrukce.
Závěr: Náš případ potvrzuje přednosti CTA ve srovnání s ultrazvukem při hodnocení postižení vícečetnými aneurysmaty. Výběr způsobu léčby – ligace – byl dán závažným přidruženým onemocněním a průchodností femoropopliteálního segmentu.

ABSTRACT

Introduction: Aneurysms of the deep femoral artery (DFA) are extremely rare. The diagnosis is difficult due to the anatomical location of the artery. Generally, the aneurysm presents itself with its complications – compression, rupture.
Presentation of case: We present a case of 78-year-old man admitted in state of emergency in Vascular Surgery department, presenting with suddenly appearing pain and big pulsatile mass in the femoral triangle of the left thigh. The performed ultrasonography and CTA confirmed the presence of ruptured DFA aneurysm with big hematoma on the left side. CTA established also aneurysms of both iliac, femoral and popliteal arteries. Femoro-popliteal segment was patent at both sides. Due to the severe comorbidity, the performed procedure was ligation of the proximal neck of the aneurysm and suturing the ruptured wall.

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Discussion: The aneurysms of the DFA are very rare – 0.5% of all aneurysms of the peripheral vessels. Due to the small diameter physical examination rarely establishes the presence of aneurysm. Valuable methods for diagnosis are duplex ultrasonography and CTA. More important is the latter because it shows the patency and location of the DFA, distally to the aneurysm. In our case rupture of the aneurysm and patency of the femoro-popliteal segment allowed us to do simple ligation of the aneurysmal neck and suturing the ruptured wall, without distal reconstruction.
Conclusion: Our case confirms the value of CTA over ultrasonography in the estimation of the multi aneurysmal disease. The choice of treatment method – ligation, was determined by the severe comorbidity and patency of the femoro-popliteal segment.

Introduction

Aneurysms of the deep femoral artery (DFA) are extremely rare [1,2]. The true aneurysms of the DFA account for only 0.5% of all peripheral arterial aneurysms [3]. True DFA aneurysms comprise 1–2.6% of all femoral artery aneurysms [4]. Despite of the low frequency – in English language literature DFA aneurysms were mentioned in 42 cases [5], and in Japan – 30 cases to date [6], the frequency of rupture was high – 42% [7]. In 70–80% of patients with a femoral aneurysm are present multiple aneurysms with different/other location. Bilateral aneurysms are present in 72% of the cases [8].

Surgical treatment options included ligation, reconstruction, aneurysmorraphy, graft or by-pass [5]. The decision to ligate or revascularize a DFA aneurysm depends on the patency of the femoral-popliteal outflow and the feasibility of repair [2].

Case report

The presented case is of a 78-year-old patient, who entered the Vascular Surgery department in emergency condition, because of a suddenly appeared painful mass in the upper third of the left thigh three days ago. The physical examination showed persistent bilateral pulsations of the common femoral artery, pulsation of the right foot arteries, but missing pulse of the left popliteal artery and the arteries of the left calf and foot. Huge 12 cm mass was palpated on the upper third of the left thigh with the auscultation of systolic noise.

Fig. 1 – The X-ray showed swelling of the upper third of the left thigh.

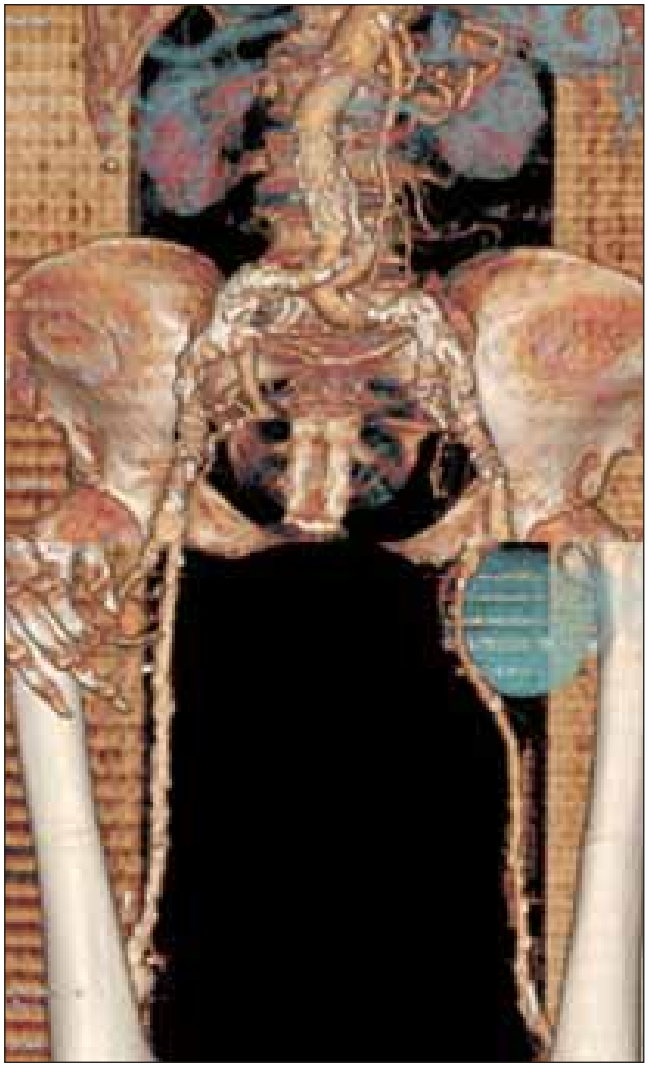

Fig. 2 – 3D VR image of the aorto-ilio-femoral segment and the hematoma.

The ultrasound examination visualized huge hematoma with arterial blood flow in the center. The X-ray showed the swollen area of the left thigh (Fig. 1).

Peripheral CTA was performed with MSCT in the Radiology department. 130 ml of Iomeron 350 mg/ml was injected followed by 50 ml saline with the injection speed of 4 ml/s. The acquisition was from the infrarenal abdomi-

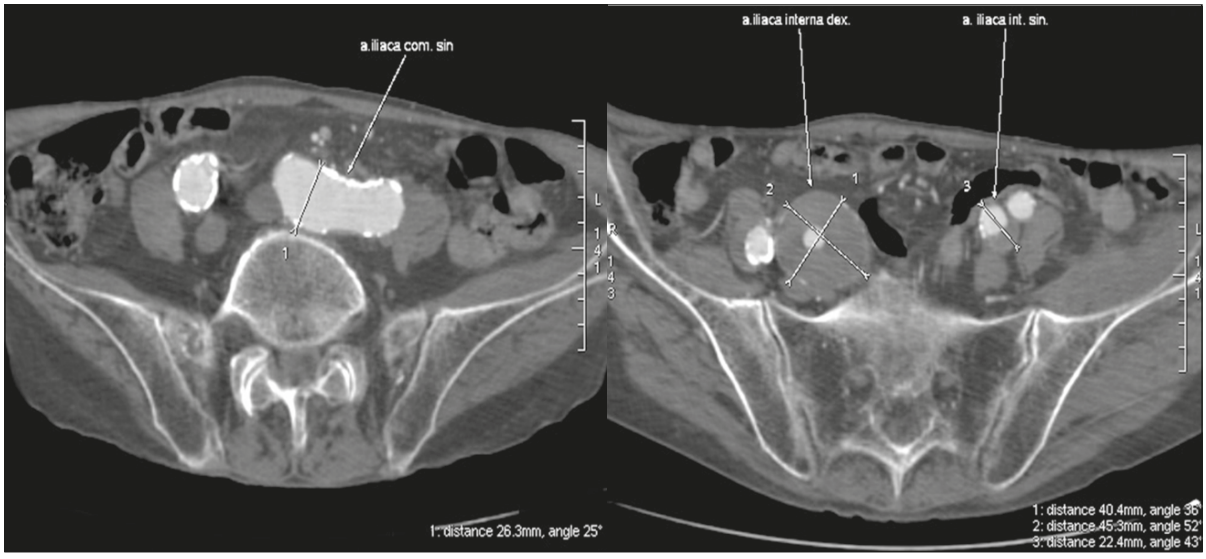

Fig. 3 – CT axial images of the aneurysms of the common iliac and internal iliac arteries.

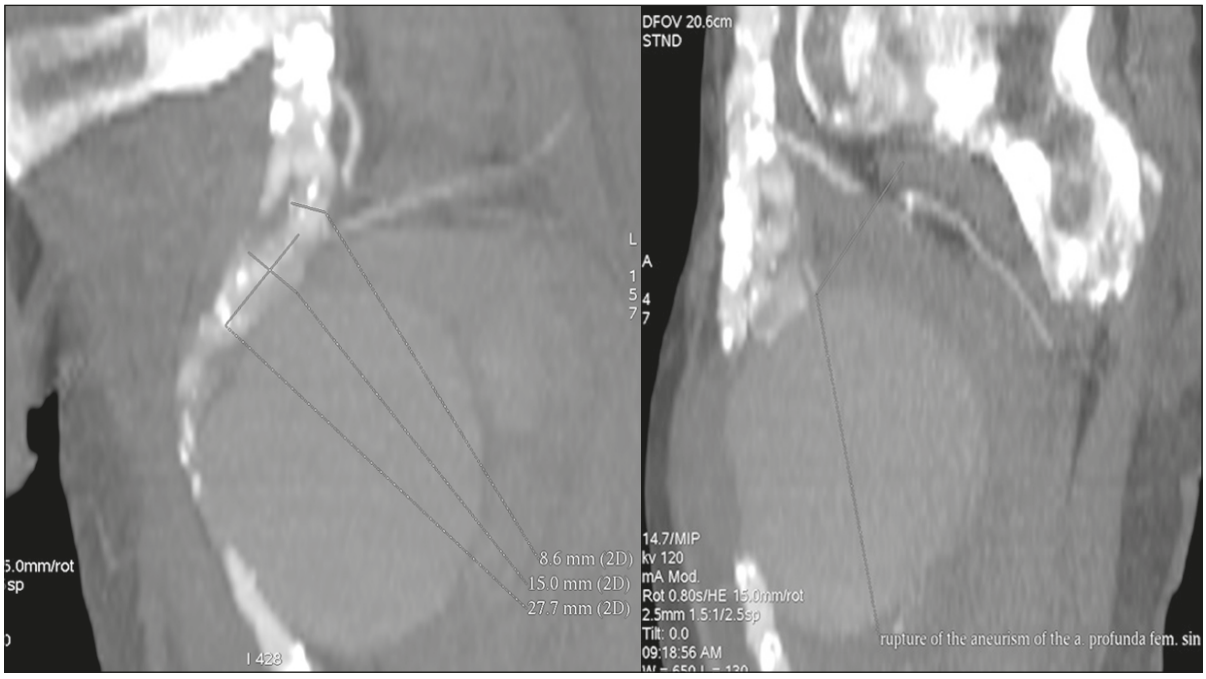

Fig. 4 – 2D coronal and sagital CT image showing the hematoma, the aneurysmal neck and the rupture of the left DFA aneurysm.

nal aorta to the feet. Post-processing tools as MIP and 3D were used to assess the images.

The peripheral CTA of the lower limbs showed the following features:

1. Multiple atherosclerotic plaques of the aorto-iliac segment and kinking of the left common iliac artery with patent superficial femoral arteries. The left SFA is compressed by round mass lesion (Fig. 2).
2. Aneurysms of the both common iliac arteries with diameter 26 mm of the left and 20 mm of the right one and both internal iliac arteries with diameter of the right one 45 mm and the left -22 mm with thrombotic masses and calcification deposits in the arterial wall (Fig. 3).
3. Aneurysms with thrombotic masses of the both deep femoral arteries with diameter of the right one 31 mm and 21 mm on the left side. The hematoma was with the size of 105 mm in diameter, causing compression and deviation of the left superficial femoral artery. The aneurysmal neck and the rupture of the left DFA aneurysm could be observed (Fig. 4).
4. Thrombotic aneurysms of the first segment of both popliteal arteries with diameter on the left side 41 mm and 39 mm on the right.

The patient was operated emergently. He had anemic syndrome (Hb 73 g/l) and severe comorbidity – diabetes mellitus, ischemic heart disease and insufficiency of the aortic valve. Mobilization and clamping of the orificium

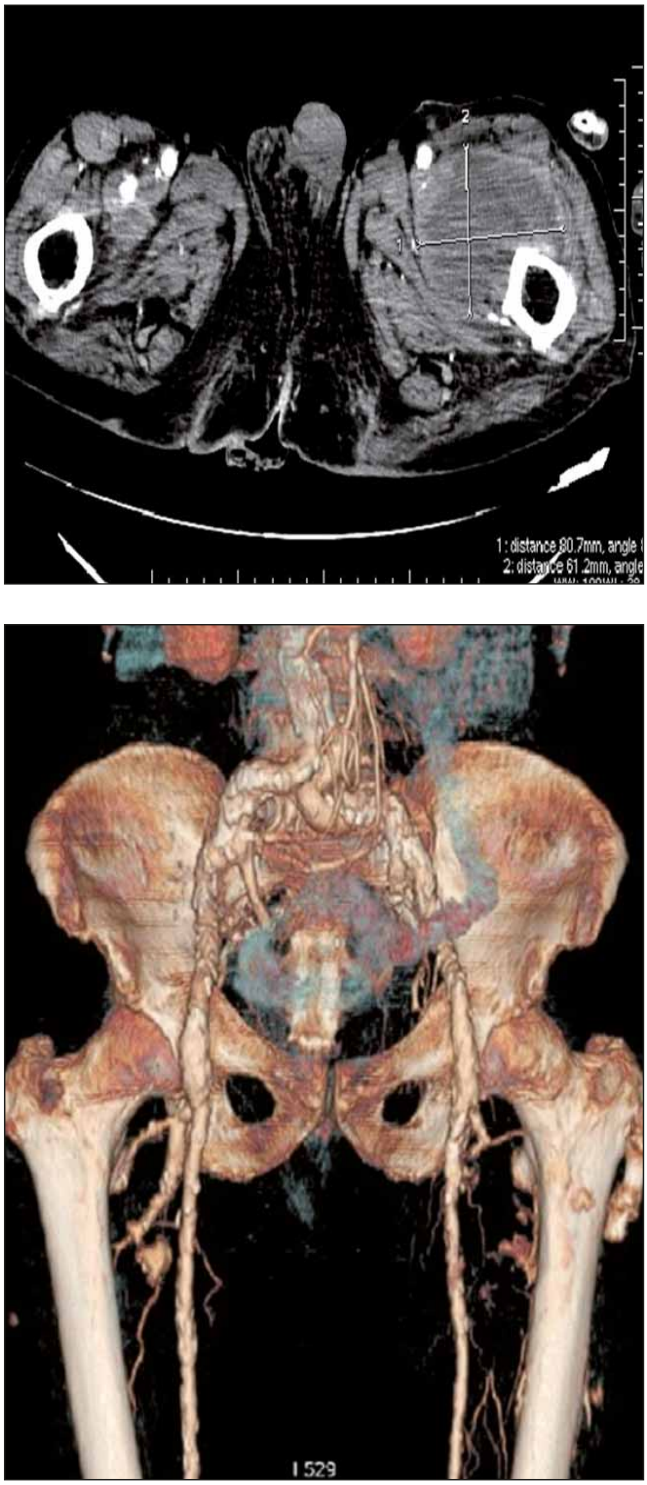

Fig. 5 – The control CT exam showed reduction in size of the hematoma with 25 mm and patent lumen of the left superficial femoral artery, which was no more compressed and dislocated.

of the left DFA was performed. After evacuation of 500 ml of the hematoma, the rupture of the aneurysm was found – at the level of the first perforating branch of the left DFA. The diameter of the aneurysm was 2.5 cm and the length of the rupture 1.5 cm. Aneurysmorraphy was performed, followed by ligation of the aneurysmal proximal neck. The patency of the femoro-popliteal segment was the reason for taking the decision of ligation. There was no aggravation of the left leg after the surgery.

Control peripheral CTA was done 1 month after the surgical treatment. The control CT exam showed reduction in size of the hematoma and patent lumen of left superficial femoral artery, that was no more compressed and dislocated (Fig. 5). The measured ankle-brachial indices (ABI) was the same before and after surgery: ABI 0.5 on the left side and 0.83 on the right. No complications were observed in the early postoperative period.

Discussion

The aneurysms of the deep femoral artery are very rare – 0.5% of all aneurysms of the peripheral arteries of the lower limbs and 1.0–2.6% of the femoral aneurysms [3,4,9]. A high complication rate (58%) is common at initial evaluation [9]. This is explained with the anatomical features of the artery and its deep location into the femoral muscles. Multiple aneurysms at different location are common and occur in 73% of the patients with DFA aneurysms [1]. The most common complication is a rupture – from 30% to 45% according to different investigators [7,10]. In our country Bulgaria the frequency rate of deep femoral artery aneurysms is unknown. Up to date there is no such publication in the Bulgarian language literature.

The diagnosis of this type of lesion is difficult to establish because of the anatomic consideration/location and the small diameter of the aneurysm. Most patients with an aneurysm of the deep femoral artery have few symptoms until it expands, and once this happens, rapid enlargement is noted [6]. According to Milotic and coworkers, even if they occur, they mostly stay clinically silent because they do not affect the viability of the leg unless a SFA occlusion is also present [11]. That's why the physical examination is insufficient and the aneurysm could be missed.

Ultrasonography and color Doppler ultrasonography have priority in diagnosis of these cases. Angiography, CT and peripheral CTA are performed in conjunction with ultrasonography for planning the procedure before surgical treatment and for follow-up after treatment [5]. To confirm the presence of synchronous aneurysm and evaluate peripheral arterial circulation, 3D CT is a valuable, noninvasive diagnostic modality [12].

For the described case in the circumstances of emergency for diagnostics were used noninvasive methods as ultrasonography, CT and CT angiography. One of the reasons to prefer CT and CTA for diagnostics was the evaluation of the internal iliac arteries' aneurysms.

The treatment of DFA aneurysms depends on the diameter of the aneurysm and the accompaniment of the complications. Basically the treatment consists of aneurysmal resection and restoring the patency of DFA. The reconstruction of DFA is obligatory when the SFA is occluded. As a perfect prosthesis graft could be used vena saphena magna [13,14]. When the femoro-popliteal segment is patent and there is severe comorbidity as the case we have presented, the treatment option of choice is ligature of the aneurysm, because the revascularization of DFA plays an important role in the blood supply of the

lower limb. Another option for distal revascularization after ligature is the femoro/profundo/popliteal bypass. The low segment aneurysm is indication for transcatheter embolization, that has the same success rate as the classic surgical procedures [15].

The presented case proved the rule that such types of aneurysms appear mostly in men, over 70 years old with severe diffuse atherosclerosis. Other scientific publication, concerning the case, show that the persistence of DFA aneurysm is an indirect sign for aneurysmal disease with multiple locations of the aneurysms. In our case, it is of great interest the bilateral multi-level location of the aneurysmal lesions.

Conflict of interest
None declared.

Funding body
None.

Ethical statement
Authors state that the research was conducted according to ethical standards.

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