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# Giant true aneurysm of superficial femoral artery in patient with multiple atherosclerotic aneurysms: A case report



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## ABSTRACT

True atherosclerotic aneurysms of superficial femoral artery (SFA) are rare and often associated with other peripheral or aortic aneurysms.

We report the case of a 84-year-old patient presenting a giant degenerative ruptured aneurysm of the superficial femoral artery. The patient underwent successful aneurysm resection and bypass grafting, with a satisfying long-term follow-up and patency of the graft. The patient was also operated one year before, for a ruptured aneurysm of the abdominal aorta.

This case report is rare, because we described a case of patient with multiple atherosclerotic aneurysms, who present, for the second time, a life threatening ruptured aneurysm. In this report, we see extreme and rapid evolution of SFA Aneurysm before being symptomatic.

Degenerative aneurysms of the lower extremity most commonly involve the popliteal artery, while they are rarely detected in the femoral region (Leon et al., 2008). In this region, aneurysms most frequently involve the common femoral artery (CFA), whereas true aneurysms of the superficial femoral artery (SFA) represent only 15% to 25% of femoral arterial aneurysms [1–5].

Degenerative aneurysms of the SFA display peculiar characteristics (in terms of clinical onset, diagnostic timing, and clinical behavior) so that they differ from other peripheral aneurysms. Because the relative rarity of this location, our case report can be useful to participate to increase the number of reported cases, and define the therapeutic approach for this rare location.

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## 1. Introduction

True atherosclerotic aneurysms of superficial femoral artery (SFA) are rare and often associated with other peripheral or aortic aneurysms [2–5].

The relative uncommonness of SFA aneurysms has been described as a result of the protection provided by surrounding muscles and the lack of bending stress, and their late diagnosis is probably attributable to the fact that they are located deep in the thigh [1]. Therefore, these aneurysms could remain unperceived until they reach a considerable diameter or until they become symptomatic. Furthermore, the first most common symptom is rupture, in contrast to popliteal or CFA aneurysms, which have a higher incidence of thrombosis or embolism [6,7].

We reported a case of true giant aneurysm of superficial femoral artery in patients with multiple atherosclerotic aneurysms.

This work is reported in line with the SCARE criteria [8].

## 2. Case report

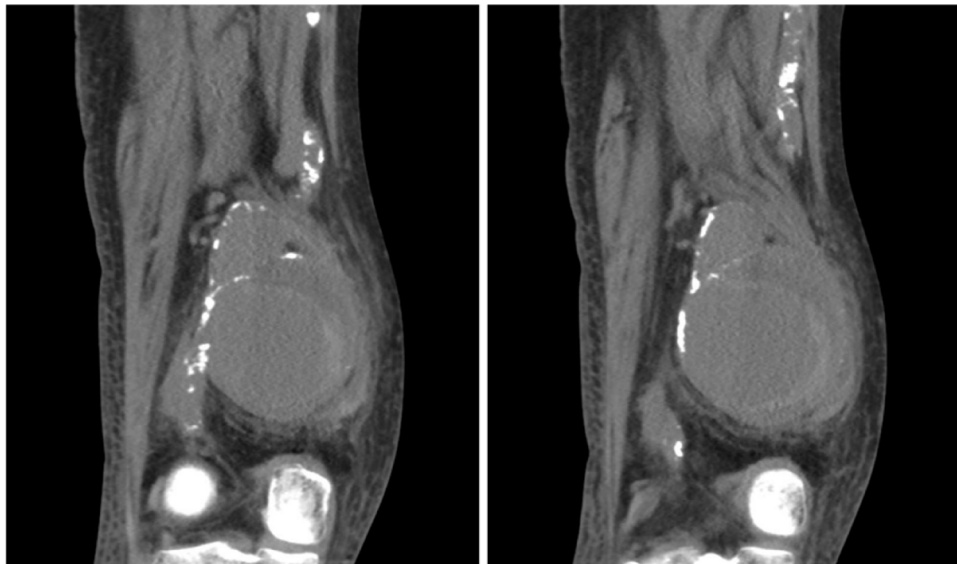
An 84-year-old man was admitted, referred by family physician, to our hospital due to the presence of a painful mass on his right inner thigh. The patient complained of tightness with distension at the inner surface of his right thigh. This pain appeared in the morning.

Physical examination confirmed a large, hard, pulsatile mass in his right inner thigh. There were no ischemic changes in his legs. Normal peripheral pulses were present in all four limbs. He had COPD gold 3, type II diabetes mellitus, severe renal insufficiency, active smoking, a ruptured aneurysm of the abdominal aorta (8 cm) operated one year ago, and dyslipidemia. The patient did not show up for follow-up.

An ultrasound demonstrated a 9 cm of great diameter aneurysm of the right SFA having a mural thrombus with a thickened wall, located in the distal third of the artery. The medial wall appears laminated in several layers. The formal diagnosis of a covered rupture is not established.

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**Fig. 1.** Coronal views of non-contrast CT scan showing giant, degenerative aneurysm of superficial femoral artery and hematic infiltrate of adjacent tissues.

A non-contrast CT-scan shows a multilayers aneurysm and an infiltrate of the adjacent tissues to the aneurysm (Fig. 1), which was compatible with a peri-aneurysmal hematoma. So, we decided to operate immediately.

It is important to note that the patient had MRI two years before, the abdominal aorta aneurysm measured 59 mm, the right SFA aneurysm already existed and measured 50 millimeters. The MRI also shows aneurysms of right common iliac artery, left common iliac artery, left SFA and left popliteal artery with great diameter of 19, 29, 25 and 17 mm respectively. But the patient refused any elective surgery. A year later, he presented a ruptured aneurysm of the abdominal aorta requiring an emergency intervention. Even if the postoperative period was uneventful, he refused any elective intervention for the others aneurysms.

Under general anesthesia, a medial longitudinal incision was made over the pulsatile mass above the knee. We entered the deep fascia and dissected the aneurysm carefully. The wall of the aneurysm was thickened and calcified, and exhibited multiple layers and medial contained hematoma (Fig. 2). The exposure of this part blew up the last hematoma that covered precariously the aneurysm. After controlling the vessels proximal and distal to the aneurysm, the aneurysm was resected and we performed polytetrafluoroethylene interposition graft. The arterial axis remained perfectly patent.

The excision of the aneurysm created a large empty space, so two drains (10 French) are left in place. The postoperative period was marked by COPD exacerbation treated with corticosteroids and bronchodilators. The patient was discharged from the hospital at 5th postoperative day.

The histological examination showed a degenerative aneurysm.

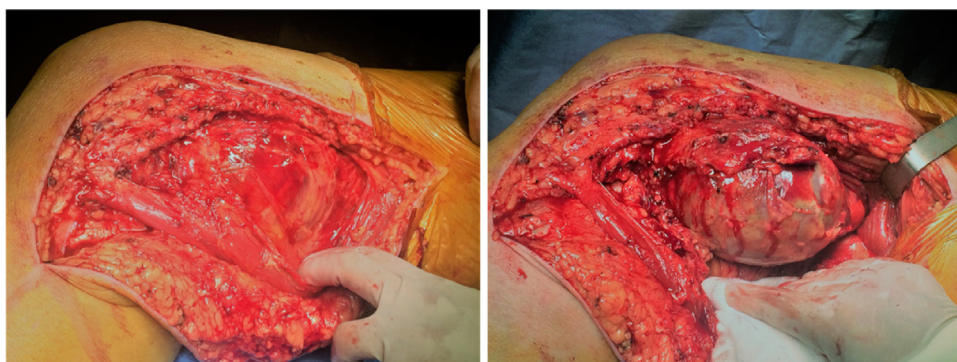
The six and twelve months follow up show a perfect patency of right SFA.

The patient will benefit few months later from percutaneous endovascular repair of left common iliac artery aneurysm.

### 3. Discussion

To our best knowledge, only hundred few cases of true SFA aneurysms have been published in literature so far, and the majority are represented by single case reports or small case series. As the majority of cases reported in the literature, we chose emergent surgical treatment, especially to avoid complete and life threatening rupture.

Only 3% of all peripheral aneurysms are femoral [9]. Among these, only the 15% are located in the SFA [10], most often located in the distal third of the artery. Other aneurysms are frequently concomitant (69%), mostly represented by abdominal aortic aneurysms (40%) as our patient.



**Fig. 2.** Operative views of giant aneurysm located on distal third of right superficial femoral artery.

SFA aneurysms are much more common in elderly men, more than popliteal artery aneurysm series [1,11,12].

The first symptom is most frequently rupture (26% vs 3% for popliteal aneurysms) [5], followed by acute ischemia. Other reported symptoms are the presence of a pulsatile mass in the thigh, pain, deep venous thrombosis, lower limb edema, or claudication, or bruising [7,13].

Despite their rarity and the frequent presentation in an emergency context with rupture or thrombosis, outcomes are typically favorable; the resection of the SFA aneurysm is easily accomplished in most of the cases, and the reconstruction can often be performed with a prosthetic graft [4,14–16]. The estimated 5-year limb salvage rate and graft patency rate are 88% and 85%, respectively.

Finally, simple ligation of the aneurysm can be an option in vascular emergencies if no distal ischemia is present, and the limb remains viable despite the occlusion of the SFA [4,9,15,17].

Ultrasound is a noninvasive first line of investigation for aneurysms. CT is an accurate and effective diagnostic tool for defining the size, configuration, internal nature of the aneurysm, and the condition of adjacent vessels other than the SFA. Because of the high incidence of associated vascular problems among elderly patients, CT scans should cover the whole aorta and its major branches as well [18].

With the development of endovascular techniques, we expected to find in the literature more reported cases treated by covered stent, but endovascular treatment has been reported only four times [19–21]. Unfortunately, long term follow-up is unavailable for these cases.

Most of the published series recommended elective repair of all asymptomatic FAAs >25 mm in diameter [1,22–23].

Our patient presents six aneurysms without evidence of collagen vascular pathology despite a genetic screening.

#### 4. Conclusions

This case report is rare, because we described a case of patient with multiple atherosclerotic aneurysms, who present, for the second time, a life threatening ruptured aneurysm. In this report, we see extreme and rapid evolution of SFA Aneurysm before being symptomatic.

Ruptured arteriosclerotic aneurysm of the SFA is very uncommon and the treatment of choice is based on replacing of the aneurysmal segment with a prosthetic graft interposition or proximal and distal artery ligation and bypass. Early diagnosis and surgical reconstruction is recommended for patients with aneurysms of the superficial femoral artery that are 2.5 cm or greater in maximum diameter and for complicated aneurysms of any size. The endovascular approach is a minimally invasive procedure which should be considered. It's also recommended to screen those patients for other aneurysms locations.

#### Informed consent

The patient give informed consent for publication.

#### Conflict of interest

None.

#### Sources of funding

None.

#### Ethical approval

Not applicable.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contribution

All authors made substantial contribution to:

- Conception and design of the study, or acquisition of data, or analysis and interpretation of data,
- Drafting the article or revising it critically for important intellectual content,
- Final approval of the version to be submitted.

#### Guarantor

Asmae Belhaj.

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