

Rare case of isolated true aneurysm in the superficial femoral artery treated with endovascular intervention: a case report

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Background

Isolated true aneurysms in the superficial femoral artery (SFA) have rarely been reported. Most cases are undiagnosed until rupture or the occurrence of complications.

Case summary

A 36-year-old woman presented with a palpable, pulsating mass on her right thigh which had increased in size over 2 months. She also had a swollen right leg and mild claudication (Stage II in Rutherford classification). For 2 months, the patient was treated by manual massage, acupuncture, and extracorporeal shock wave therapy in local clinics. Bed-side ultrasonography identified a 3.4-cm sized true aneurysm of the right SFA. There were no other aneurysms in arteries from head to toe. There was no evidence of atherosclerotic risk factors or connective tissue disease. The patient was successfully treated by a covered stent graft implantation without any complications.

Discussion

Isolated true aneurysm in the SFA is rare and tends to go undiagnosed especially in young women. Ultrasonography is an easy and useful diagnostic tool for differential diagnosis of thigh mass. In this case, endovascular treatment was safely applied for a true aneurysm without rupture.

Keywords

Case report • True aneurysm • Superficial femoral artery aneurysm • Ultrasonography • Endovascular treatment

Learning points

- For mass on thigh, ultrasonography is an easy to use and non-invasive diagnostic tool for differential diagnosis.
- True aneurysm of the femoral artery is rare and can occur in young patients without traditional risk factors and concomitant aneurysm of other arteries.
- Endovascular treatment for true aneurysm of the femoral artery is a safe and effective treatment especially in case of unruptured aneurysm.

Introduction

Aneurysms are rare in the femoral artery and rarer in the superficial femoral artery (SFA).^{1–3} Of the small number of reported cases, femoral artery aneurysms frequently occur concurrently with other aneurysms. They share similar risk factors with aortic aneurysms including older age, male sex, smoking, hypertension, diabetes mellitus, or hyperlipidaemia.⁴ Due to its anatomical location deep within the leg, the diagnosis of a SFA aneurysm may be delayed until complications occur.^{2,3,5} In the absence of aforementioned risk factors, diagnosis could be extremely delayed until severe complications such as rupture occur.

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Timeline

Time	Clinical presentation and treatments
2 months before visit	First noticed mass on right leg Misdiagnosis as a simple lump on thigh during 2 months
1 day before visit	Bed-side ultrasonography revealed 3.4 cm aneurysm on right superficial femoral artery (SFA)
The day of visit	Angiography with computed tomography and magnetic resonance revealed no other aneurysm of arteries True aneurysm of right SFA was treated with balloon-expandable covered stent (LIFESTREAM®, BARD Inc., NJ, USA)
6 days after visit	Discharged without any complication

Case presentation

A 36-year-old woman with no past medical history presented at the hospital with a mass on her right thigh that had increased in size over 2 months. The patient complained of discomfort and swelling of her right lower leg and mild claudication (Stage II in Rutherford classification), which were aggravated after exercise. Physical examination revealed a palpable, pulsating mass on her right thigh. The patient's vital signs were stable; blood pressure was 119/68 mmHg and heart rate was 79 b.p.m.

The patient had no history of trauma in her right leg. She started playing golf 3 months prior with over 2 h of hard training daily. She noticed the right leg was swollen and uncomfortable when wearing tight pants from 2 months before her visit. Due to no improvement of the symptoms, she visited the clinic of anaesthesiology and pain medicine. The doctor performed radiographical examination of her right leg but found no abnormality and, therefore, prescribed physical massage therapy twice a week. As there was no significant improvement in the symptoms, she visited an alternative medicine clinic and was treated with acupuncture therapy and extracorporeal shock wave therapy on the right leg. This resulted in worsening of the symptoms. Finally, hospital bed-side ultrasonography enabled the detection of a 3.4-cm sized SFA aneurysm (Figure 1).

Angiography with computed tomography on her lower extremities revealed a 4.3-cm by 3.3-cm sized aneurysm at the right mid-to-distal SFA (Figure 2). Aortic angiography with computed tomography and brain angiography with magnetic resonance imaging did not show any aneurysmal change in other arteries.

As for the aetiology of her condition, the patient had no risk factors for SFA aneurysm. The patient was a never smoker and had no previous medical history of hypertension, diabetes mellitus, or hyperlipidaemia. The patient had no history of infection including syphilis or tuberculosis, with negative results for rapid plasma regain test or interferon gamma release assay. The antinuclear test was also negative.

Invasive peripheral angiography revealed a true aneurysm of SFA, and a covered stent graft (LIFESTREAM®, diameter 7 mm, length

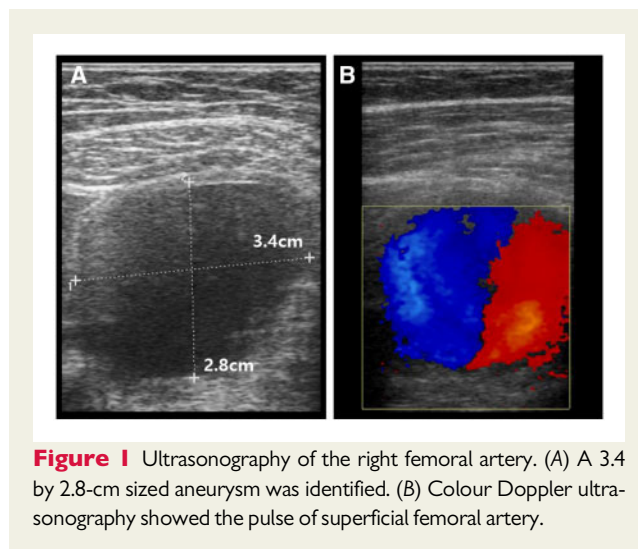


Figure 1 Ultrasonography of the right femoral artery. (A) A 3.4 by 2.8-cm sized aneurysm was identified. (B) Colour Doppler ultrasonography showed the pulse of superficial femoral artery.

58 mm, C.R. BARD, Inc., NJ, USA) was implanted, followed by adjunct ballooning with a 7-mm sized balloon (MUSTANG™, Boston Scientific, MA, USA) (Figure 3). The final angiography revealed good positioning of the stent graft with no endovascular leakage. The procedure ended without any complications, and the patient was discharged with a course of dual antiplatelet medication. After discharge, the patient is followed for >3 months without complications.

Discussion

Isolated true aneurysms in the SFA are a rare disease that is prone to misdiagnosis. Most of the previously reported cases occurred in elderly individuals and were ruptured and, therefore, surgically treated.^{1,2,5} A previous review article analysed 61 cases of SFA aneurysm; the average patient age was 75.7 years (range 59–95), 24 (39.3%) aneurysms were not ruptured, and in only 3 (4.9%) cases endovascular treatment was used.² Our case was characterized by an unusual clinical course in that SFA aneurysm was diagnosed in a young patient in the absence of any risk factor, unruptured at diagnosis, and involved endovascular treatment. Particularly, the patient's age, 36 years, is much lower than the previously reported lowest age of 58 years.³

Atherosclerosis is the dominant aetiology of true aneurysm,³ but connective tissue disease, infection, or trauma could be alternate causes. One case of congenital aneurysm has also been reported in early childhood.⁶ After excluding other causes, we speculated that trauma is the most plausible cause of this aneurysm. The distal femoral artery could potentially be deformed by bending, twisting, and compressing upon itself with limb flexion and extension.⁷ Unnoticed minor trauma while playing golf and repeated external stress owing to acupuncture and shock wave therapy of the right leg during misdiagnosis could be the most likely causes of the aneurysm in this case. Misdiagnosis and inappropriate mechanical treatment may have worsened this condition.

Ultrasonography with Doppler imaging is easy to use and is a non-invasive method for detecting SFA aneurysm. Hence, if a chronic



Figure 2 Arteriography of the entire body. (A) Cerebral arteries. (B) Carotid arteries with magnetic resonance imaging. (C) The aorta with computed tomography was normal. (D) Computed tomography angiography identified isolated true aneurysm of the right superficial femoral artery.

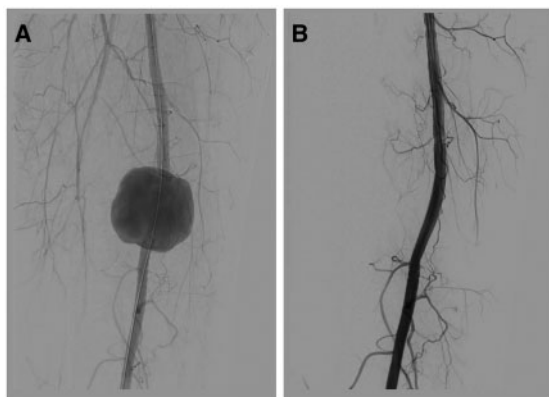


Figure 3 Invasive peripheral angiography. (A) True aneurysm of right superficial femoral artery. (B) Final angiography showed successful endovascular intervention with covered stent.

mass on the patient's thigh is palpable, ultrasound should be considered as the first-choice method of diagnosis. Angiography of computed tomography is the gold standard method for diagnosing possible aneurysm, which provides anatomical information and helps to plan further treatment.

Despite the small number of cases and limited long-term follow-up evidence, endovascular treatment is strongly recommended in cases of SFA aneurysm.^{1-3,5} Surgery should still be the standard treatment especially in the case of complications. However, in patients without complicated aneurysm, endovascular interventions can avoid typical postsurgical stress symptoms. Additionally, anastomotic sutures used in surgery are avoided, which decreases the risk of restenosis and thrombosis.³ Our patient was also treated with endovascular treatment, and there were no early complications.

Among 10 cases of superficial femoral aneurysms with endovascular treatment, there was no consistency regarding the use of antiplatelet agents; it varied from no antiplatelet agent administration to lifelong use of dual antiplatelet agent.⁵ We initially used dual

antiplatelet agents and planned to use only one antiplatelet agent after 1 month, as suggested in the current guideline for peripheral artery diseases.⁸

Conclusions

Isolated true aneurysm of SFA may also occur in young women with no risk factors. Ultrasonography is recommended as a first-line diagnostic method in patients with leg mass followed by an accurate diagnosis of true aneurysm using angiography of computed tomography. The use of endovascular treatments for SFA aneurysm showed positive treatment outcome without complications.

Lead author biography



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Supplementary material

[Supplementary material](#) is available at *European Heart Journal - Case Reports* online.

Slide sets: A fully edited slide set detailing this case and suitable for local presentation is available online as [Supplementary data](#).

Consent: The author/s confirm that written consent for submission and publication of this case report including image(s) and associated text has been obtained from the patient in line with COPE guidance.

Conflict of interest: none declared.

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