

Case Report

A rare case of submassive pulmonary embolism after spontaneous rupture of superficial femoral artery pseudoaneurysm

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ABSTRACT

Spontaneous rupture of a superficial femoral artery (SFA) pseudoaneurysm without prior trauma or intervention is exceedingly rare. This report includes a 45-year-old man with morbid obesity (BMI 38) who presented with acute left lower extremity pain and swelling after experiencing a “pop” in his posteromedial thigh while bending. Imaging revealed a ruptured distal SFA branch pseudoaneurysm with a large hematoma, successfully treated with thrombin injection. On postoperative day one, he developed bilateral pulmonary emboli with right heart strain, progressing to submassive pulmonary embolism by day three. This case highlights hematoma-induced venous compression as a potential mechanism for venous thromboembolism.

Keywords: Pseudoaneurysm, Superficial femoral artery, Venous thromboembolism, Thrombin Injection, Endovascular therapy

INTRODUCTION

Pseudoaneurysms of the superficial femoral artery (SFA) most commonly result from trauma, iatrogenic injury, or infection, while spontaneous formation and rupture in otherwise healthy individuals without prior intervention are exceedingly rare.¹ Venous thromboembolism (VTE), including deep venous thrombosis (DVT) and pulmonary embolism (PE), is a major cause of cardiovascular morbidity and mortality and is typically driven by hypercoagulability, stasis, and endothelial injury.²

External venous compression from an adjacent hematoma is an uncommon but recognized cause of venous stasis and thrombosis.³ This is a rare case of spontaneous SFA pseudoaneurysm rupture resulting in a large thigh hematoma, likely causing venous compression and subsequent DVT formation with progression to

submassive PE. This case underscores a unique and important intersection between arterial pathology and venous thromboembolic complications.

CASE REPORT

A 45-year-old man with morbid obesity (BMI 38) and no prior surgical history presented with acute left lower extremity pain and swelling after feeling a “pop” in his posteromedial thigh while bending to put on a sock. Examination demonstrated distal thigh edema and ecchymosis with intact distal pulses, soft compartments, and preserved motor and sensory functions.

Computed tomography angiography (CTA) revealed a distal superficial femoral artery (SFA) branch pseudoaneurysm with an 11×5 cm posteromedial thigh hematoma. Angiography confirmed active extravasation

from a ruptured SFA branch pseudoaneurysm (Figure 1A), which was successfully treated with thrombin injection (Figure 1B).

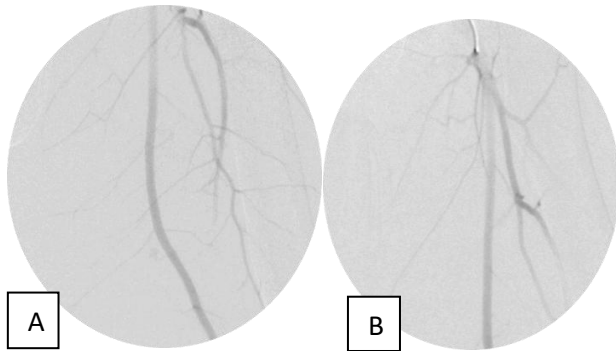


Figure 1: (A) Ruptured pseudoaneurysm from a small SFA branch with active contrast extravasation; (B) post thrombin treated SFA branch showing resolution of the pseudoaneurysm.

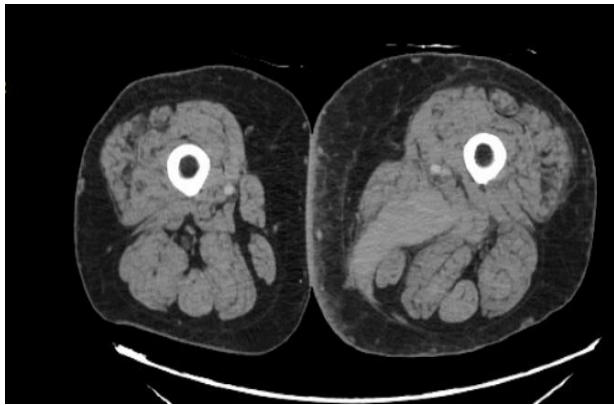


Figure 2: CTA abdominal aorta and bilateral iliofemoral runoff showing persistent 11×5 cm left posteromedial compartment hematoma.

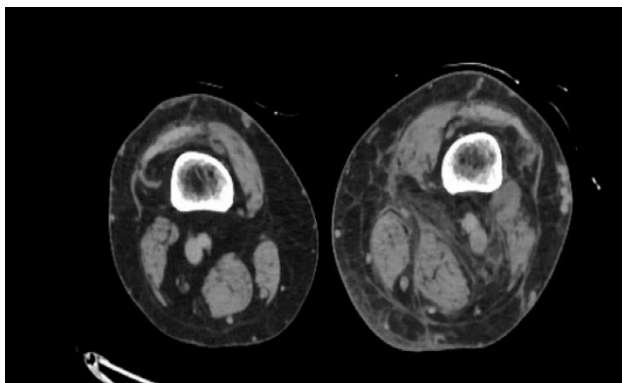


Figure 3: CTA abdominal aorta and bilateral iliofemoral runoff showing questionable thrombus within the left distal superficial femoral vein/popliteal vein.

On postoperative day one, the patient developed dyspnea and tachycardia. CT pulmonary angiography demonstrated

bilateral lobar pulmonary emboli with right heart strain, prompting initiation of therapeutic enoxaparin. Duplex ultrasound showed successful pseudoaneurysm thrombosis without evidence of DVT. On postoperative day three, he developed recurrent chest pain, hypoxemia, and findings consistent with submassive PE.

Repeat CTA demonstrated resolution of the pseudoaneurysm but persistent thigh hematoma with suspected thrombus in the distal SFA and popliteal veins (Figures 2 and 3). Hypercoagulable workup was notable for a positive antinuclear antibody and elevated C4 level, and rheumatology follow-up was arranged.

DISCUSSION

This case illustrates a rare sequence linking spontaneous arterial pathology to venous thromboembolism. SFA pseudoaneurysms are most associated with trauma, catheterization, or surgery, while spontaneous formation and rupture are exceedingly uncommon.^{4,5} Although no clear etiology was identified in this patient, the positive antinuclear antibody raises the possibility of an underlying inflammatory or autoimmune process.⁵ A key feature of this case is the development of pulmonary embolism shortly after pseudoaneurysm treatment. While no initial DVT was identified, the temporal relationship and subsequent imaging findings suggest thrombus formation secondary to venous compression from the large thigh hematoma. Large intramuscular thigh hematomas can exert significant mass effect on adjacent venous structures, particularly the femoral and profunda femoris veins. Venous compression results in stasis, a central component of Virchow's triad, and predisposes to thrombosis.^{3,6} Similar pathophysiology has been described in conditions such as May-Thurner syndrome and compartment syndromes, where external compression impairs venous return and promotes thrombus formation.⁷ In this patient, the posteromedial compartment hematoma likely compressed adjacent venous structures, promoting DVT formation that subsequently embolized to the pulmonary circulation.

The patient's postoperative deterioration, characterized by hypoxemia, tachycardia, elevated troponin, and right ventricular strain, was consistent with submassive pulmonary embolism.⁸ Submassive PE is associated with

patients.^{9,10} In this case, symptoms resolved with anticoagulation alone. This case highlights that spontaneous pseudoaneurysm rupture should be considered in patients presenting with acute limb swelling and a sudden "popping" sensation, even in the absence of trauma. Large arterial hematomas may cause venous compression, leading to DVT and pulmonary embolism.^{3,6} Early surveillance for thromboembolic complications and multidisciplinary management are essential. To our knowledge, this progression from spontaneous SFA pseudoaneurysm rupture to hematoma-induced venous

compression and pulmonary embolism is rarely described in the literature.

CONCLUSION

Spontaneous rupture of an SFA pseudoaneurysm is an exceptionally rare event, particularly in patients without prior trauma or intervention. This case exemplifies a rare but mechanistically coherent sequence in which spontaneous arterial pseudoaneurysm rupture resulted in a large intramuscular hematoma, producing extrinsic venous compression, venous stasis, and subsequent thrombus formation with embolization an underrecognized but well-supported cause of venous thromboembolism. Awareness of this mechanism is critical for early diagnosis and timely management. Clinicians should maintain a high index of suspicion for venous thromboembolism in patients with large intramuscular hematomas following arterial injury, even when initial imaging is negative.

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