CASE REPORT

Femoral artery pseudoaneurysm due to a gunshot injury

Abdullah Algin,[1] Mehmet Ozgur Erdogan,[2] Kaan Yusufoglu,[3] Huseyin Avni Findikli,[4] Hakan Aydin[5]

Abstract

Femoral artery pseudoaneurysms are commonly iatrogenic due to increasing use of the artery for arterial interventions. Other reasons of pseudoaneurysm formation are intravenous drug use and penetrating trauma. Here, we have discussed the management strategy of a femoral artery pseuodoaneursym and the modalities for preventing the misdiagnoses of the pseudoaneurysm in the emergency department.

A 50-year-old male patient was referred to our emergency department (ED) with claudication and severe local swelling. Ten days earlier, he had been referred to another ED immediately after a gunshot injury to the left inguinal zone. Duplex ultrasound and CT angiography of the left lower extremity revealed a 4 cm sac of pseudoaneurysm on the distal part of posterofemoral branch of deep femoral artery and a 9*10 cm haematoma on the posteromedial part of pseudoaneurysm. The patient underwent open repair surgery due to co-existing large haematoma and risk of infection. The patient was discharged after three days hospitalization.

Pain, extremity oedema, pulsatile mass, femoral bruit, palpable thrill, and compressive neuropathy should alert the physician to possible femoral artery pseudoaneurysm. Duplex ultrasound and CT angiography are important diagnostic steps to reveal a possible life-threatening vascular injury.

Keywords: Gunshot injury, Pseudoaneurysm, Femoral Artery.

Introduction

Femoral artery pseudoaneurysms are commonly iatrogenic due to increasing use of the artery for arterial interventions.[1] Iatrogenic causes of pseudoaneurysms are anticoagulation therapy, inadequate compression after arterial intervention, improper arterial puncture technique and post-surgical complications. Other reasons of pseudoaneurysm formation are intravenous drug use and penetrating trauma.[2]

Pseudoaneurysms of the femoral artery are surrounded by a fibrous capsule. The pseudoaneurysm does not include the true layers of the arterial wall. Pseudoaneurysms are related with a leak from an arterial defect that is surrounded with soft tissues and a haematoma.[3]

In this case report, we have evaluated a gunshot injury related pseudoaneurysm of femoral artery. We have discussed the management strategy of a femoral artery pseuodoaneursym and the modalities for preventing the misdiagnosis of the pseudoaneurysm in the emergency department.

Case Report

A 50 year old male patient was referred to our emergency

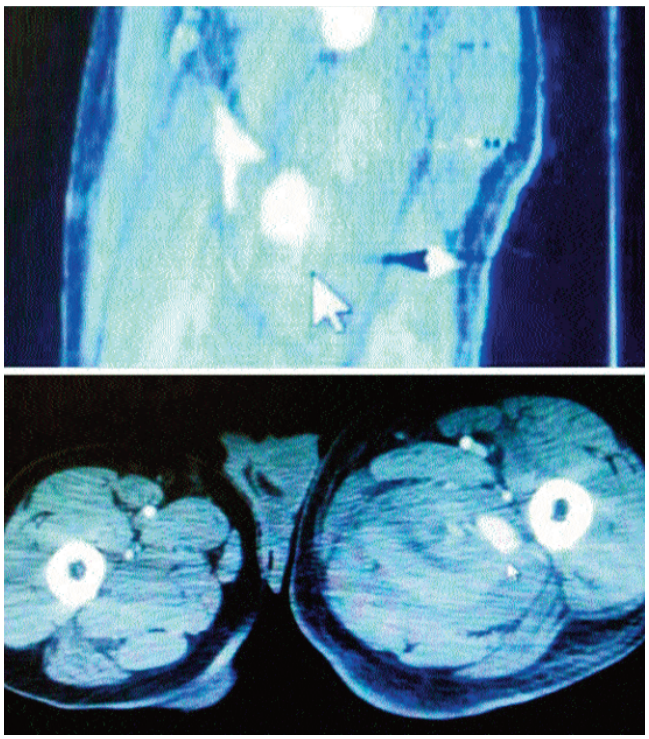

Figure-1: Computerized tomography images in coronal and axial planes showing femoral artery pseudoaneurysm.

Department of Emergency Medicine, [1]Adiyaman University Training and Research Hospital, Adiyaman, [2]Haydarpasa Numune Training and Research Hospital, Istanbul, [3]Hamidiye Sisli Etfal Training and Research Hospital, Istanbul, [4,5]Department of Internal Medicine Adiyaman University Training and Research Hospital, Adiyaman, Turkey.
Correspondence: Abdullah Algin. Email: dralgin@hotmail.com

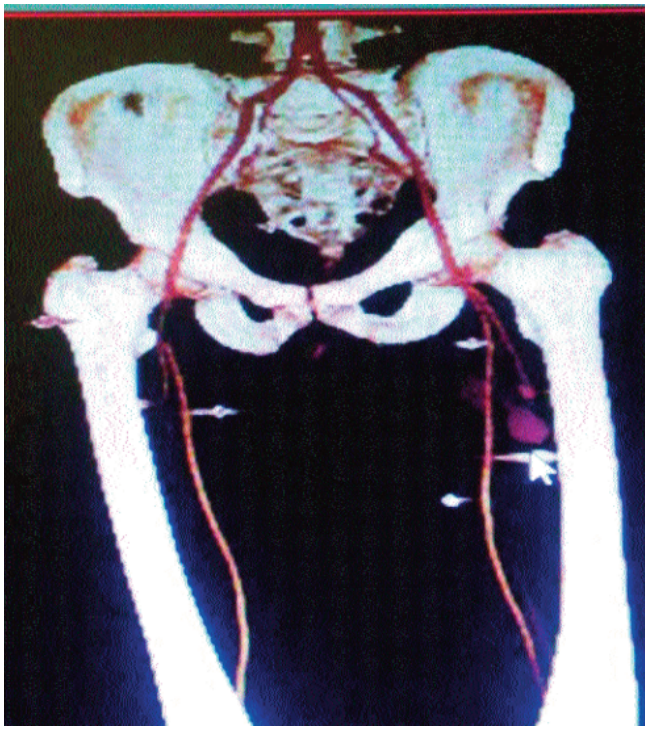

Figure-2: 3-D Computerized tomography showing a 4 centimeters sac of pseudoaneurysm on the distal part of posterofemoral branch of deep femoral artery.

department (ED) of Haydarpasa Numune Training and Research Hospital, Istanbul, Turkey, in March 2014 with claudication and severe local swelling. He had been previously referred to another ED immediately after a gunshot injury to the left inguinal zone, ten days ago. He was discharged after evaluation of pelvis X-rays, duplex ultrasound evaluation, and a 24 hours observation period.

Patient's vital signs were stable at the time of referral. Initial examination of the wound revealed a large ecchymosis and severe local swelling. Assessment of the peripheral vascular system showed normal pulse and no bruits. On labaratory white cell count was 19.540/mL, haemoglobin was 7,65 g/dL and D-dimer level was 10000 (cutoff: 500ng/mL). Duplex ultrasound and CT angiography of the left lower extremity revealed a 4 cm sac of pseudoaneurysm on the distal part of posterofemoral branch of deep femoral artery and a 9*10 cm haematoma on the posteromedial part of pseudoaneurysm (Figure-1, 2). The patient underwent open repair surgery due to the co-existing large haematoma and risk of infection. Pseudoaneurysm pouch was accessed through a site close to the possible intervention site. Intervention site on the artery was primarily repaired with 5-6/0 polypropylene suture. After bleeding control and placing a small hemovac drain, tissues were closed in layers. The patient was discharged after a three days hospitalization. Written consent from the patient and approval from the hospital was obtained for presenting this case report.

Discussion

Femoral artery pseudoaneurysms are commonly seen after femoral artery catheterization but may be caused by trauma, anastomotic leakage, or infection.[4] Our case is due to a gunshot injury of the lower extremity. The ED physician should be aware of the common causes of pseudoaneurysms. These causes may easily lead the physician to diagnosing the pseudoaneurysm.

Clinical signs of femoral pseudoaneurysms are pain, extremity oedema, pulsatile mass, femoral bruit, palpable thrill, and compressive neuropathy.[5] In our patient, there was only pain and local swelling in the location of the gunshot wound. Lack of physical examination findings can not rule out a psudoaneurym and it must be evaluated with additional imaging methods. Any suspected vascular injury should be evaluated with doppler ultrasound, CT angiography or conventional angiography.[6]

Recent studies revealed that high D-Dimer levels may predict the existence of a pseudoaneurysm. In our case D-Dimer level was very high. D-dimer levels may lead the ED physician to evaluate the patient for a possible formation of pseudoaneurysm.[7]

Patients should be consulted with vascular surgeon and an outpatient follow up should be planned. A follow up protocol after injury will help the physicians to re-evaluate the healing of wound and possible complications, not existing at the initial admission time, such as infections, haematoma or pseudoaneurysm.[8]

Most of femoral pseudoaneurysms smaller than 3 cm in diameter spontaneously thrombose. In asymptomatic patients, small pseudoaneurysms may be followed with serial duplex ultrasound exams. Symptomatic pseudoaneurysms, larger than 3 cm, must be treated. Open pseudoaneurysm repair should be undertaken in the setting of infection, rapid expansion or conservative methods are not effective.[9]

Our patient had a 4 cm diameter pseudoaneurysm and a co-exisiting haematoma and risk of infection. Open surgical repair was the choice of treatment in this situation.

Conclusion

These pseudoaneurysms due to trauma are rare and challenging problems for both the emergency physician

and the trauma surgeons. In the differential diagnose of an unexpected severe symptom in penetrating extremity traumas, possible arterial injury, haematoma, pseudoaneurysm and infection should be considered.

Disclosure: Authors have no conflict of interest to disclose.

Conflict of Interest: None to declare.

Funding Disclosure: None to declare.

References

1. Huseyin S, Yuksel V, Sivri N, Gur O, Gurkan S, Canbaz S, et al. Surgical management of iatrogenic femoral artery pseudoaneurysms: A 10-year experience. Hippokratia. 2013; 17:332-6.
2. Cakir H, Tuncel C, Uncu H, Okten CC, Karaca S, Ozsoyler I. Iatrogenic femoral artery pseudoaneurysms. Türk Gö?üs Kalp Damar Cerrahisi Dergisi. 2013; 21:54-8.
3. Khoshnevis J, Sobhiyeh MR, Fallah Zavareh M. Deep Femoral Artery Branch Pseudoaneurysm After Orthopedic Procedure Requiring Surgical Treatment: A Case Report, Trauma Mon. 2012;17:305-8.
4. Corriere MA, Guzman RJ, True and false aneurysms of the femoral artery. Semin Vasc Surg. 2005;18:216-23.
5. Naouli H, Jiber H, Bouarhroum A. False aneurysm of perforating branch of the deep femoral artery - Report of two cases, Int J Surg Case Rep. 2015;14:36-9.
6. Wani ML, Sheikh MT, Hassan N, Irshad I, Ahangar AG, Ganie FA, et al. Evaluating Peripheral Vascular Injuries: Is Color Doppler Enough for Diagnosis? Int Cardiovasc Res J. 2014; 8:15-7.
7. Hoke M, Koppensteiner R, Schillinger M, Haumer M, Minar E, Wiesbauer F, et al. D-dimer testing in the diagnosis of transfemoral pseudoaneurysm after percutaneous transluminal procedures. J Vasc Surg. 2010; 52:387-7.
8. Tetik O, Yetkin U, Bayata S, Bayrak S, Gürbüz A. Surgical approach to giant femoral artery pseudoaneurysm due to gunshot injury. Anadolu Kardiyol Derg. 2008; 8:E20-1.
9. Toursarkissian B, Allen BT, Petrinec D, Thompson RW, Rubin BG, Reilly JM, et al. Spontaneous closure of selected iatrogenic pseudoaneurysms and arteriovenous fistulae. J Vasc Surg. 1997; 25:803-8.