

Pseudoaneurysm of arteria profunda femoris following the surgery of proksimal femur fracture: a case report

Proksimal femur kırığı cerrahisi sonrası gelişen arteria profunda femoris psödoanevrizması: olgu sunumu

Burçin Keçeci, Levent Küçük*, Mustafa Parıldar, Nadir Özkayın, Kemal Aktuğlu

Department of Orthopaedic Surgery and Traumatology (B. Keçeci, MD, L. Küçük, MD, N. Özkayın, MD, Prof. K. Aktuğlu, MD), Department of Radiology (Prof. M. Parıldar, MD), Ege University School of Medicine, TR-35100 İzmir

Abstract

Pseudoaneurysm of arteria profunda femoris after the hip fracture is a very rare complication. The mechanism of pseudoaneurysm formation may be traumatic, iatrogenic or infective injury to the arterial wall. Pseudoaneurysms of arteria profunda femoris usually give late symptoms such as persistent hip pain, thigh swelling, presence of a pulsatile mass and unexplained anemia that may suggest the diagnosis. Surgical repair, transcatheter embolization, thrombin injection under duplex imaging guidance is the treatment options for pseudoaneurysm. Angiography is a well known technique for accurate diagnosis and may be the first choice for the minimal invasive treatment. We present a case of a pseudoaneurysm of arteria profunda femoris following osteosynthesis of a proksimal femur fracture. Pseudoaneurysm was successfully treated by percutaneous placement of embolization coils.

Keywords: Aneurysm, false, femoral fractures, embolization, therapeutic, angiography

Özet

Kalça kırıkları sonrasında derin femoral arterde psödoanevrizma gelişmesi çok nadir görülen bir komplikasyondur. Psödoanevrizma arter duvarının travmatik, iatrojenik ya da enfektif bir yaralanmasına bağlı olarak gelişebilir. Derin femoral arterde gelişen psödoanevrizmalar genellikle geç bulgu verirler. Bu bulgular ısrarlı kalça ağrısı, uylukta şişlik, pulsatil kitle varlığı ve sebebi ortaya konamayan anemi şeklinde olabilir. Tedavi seçenekleri arasında cerrahi yöntemler, embolizasyon, thrombin enjeksiyonu sayılabilir. Anjiyografi hem teşhis hem de aynı seansta tedavi imkânını sağlayabilen etkili bir yöntemdir. Proksimal femur kırığı cerrahi tedavisi sonrası derin femoral arterde psödoanevrizma gelişen ve anjiyografik yöntemlerle perkutan embolizasyon uygulanarak tedavi edilen bir olguyu sunuyoruz.

Anahtar sözcükler: Psödoanevrizma, femur kırıkları, embolizasyon, anjiyografi

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***Corresponding author:**

Dr. Levent Küçük, Ortopedi ve Travmatoloji Anabilim Dalı, Ege Üniversitesi Tıp Fakültesi, TR-35100 İzmir. E-mail: kucuklevent@yahoo.com

Introduction

Pseudoaneurysm of arteria profunda femoris (APF) after the hip fracture is very rare complication [1, 2]. The mechanism of pseudoaneurysm formation may be traumatic, iatrogenic or infective injury to the arterial wall. Pseudoaneurysms of arteria profunda femoris usually give late symptoms such as persistent hip pain, thigh swelling, presence of a pulsatile mass and unexplained anemia [3]. The interval from injury to

pseudoaneurysm presentation is variable. A delayed presentation because of minimal arterial wall damage is a common condition. Surgical repair, transcatheter embolization, thrombin injection under duplex imaging guidance are the treatment options for pseudoaneurysm [4]. Angiography is a well known technique for accurate diagnosis and may be the first choice for the minimal invasive treatment [5-7].

We present a case of a pseudoaneurysm of arteria profunda femoris following osteosynthesis of a proksimal femur fracture. Pseudoaneurysm was successfully treated by percutaneous placement of embolization coils.

Case report

A 75 years old man was admitted after a fall to our hospital with proksimal left femur fracture. Prophylactic anticoagulant therapy was administered before the operation. Within four days after injury, fluoroscopy aided osteosynthesis was performed with a 95° angular plate. The patient recovered uneventfully after surgery and was discharged home six days later.

Three weeks after the operation the patient presented with pain, tenderness and nonpulsatile swelling in the thigh with overlying ecchymosis. The distal pulses were palpable. There was no problem with fracture and angular plate in the radiologic examination. Duplex ultrasound (US) showed a large hematoma, but no pseudoaneurysm. The patient was consulted to cardiovascular surgeon. The patient underwent open drainage of hematoma. Postoperatively the complaints did not get better. For the definitive diagnosis we proceeded to perform transfemoral intraarterial digital subtraction angiography. A pseudoaneurysm arising from deep perforating branch of the left arteria profunda femoris was diagnosed (Figure 1). Transcatheter embolization was performed immediately after the diagnosis. Left deep femoral artery was selectively catheterized with cross-over placement of a 6F multipurpose guiding catheter through the right common femoral artery puncture. This catheter was used as an introducing catheter. A microcatheter (Rapid Transit, Cordis, Roden Netherlands) was used as inner coaxial catheter to superselectively catheterize the injured segment of the vessel. The microcatheter was introduced into the aneurysm neck with roadmapping. The parental artery was embolized carefully near the aneurysm neck with pushable platinum coils (Trufill, Cordis Endovascular system). The sac of the pseudoaneurysm was too large for coil embolization. Proximal and distal segment of the vessel was embolized to prevent retrograde filling of the aneurysm. After placement of each coil, contrast medium was injected through the guiding catheter to check the patency of the aneurysm. Seven coils were placed to secure the thrombosis (Figure 2).

There was no evidence of recurrence at 3-month follow-up and the fracture was anatomically consolidated, but the patient had limited knee flexion and also muscle atrophy because of insufficient rehabilitation. The examination showed 0°-90° range of motion (ROM) on the left knee. Two weeks after the rehabilitation, ROM was better (0°-120°) and he was discharged in good condition.

We examined the patient two years after the operation. The fracture was totally healed and he was able to walk long distances without any orthopedic support.



Figure 1. The pseudoaneurysm (☆) arising from deep perforating branch of the left arteria profunda femoris.



Figure 2. Proximal and distal segments of the vessel were embolized to prevent retrograde filling of the aneurysm. Seven coils were placed to secure the thrombosis.

Discussion

Vascular injuries after orthopedic surgery are rare complications [1, 2]. In current literature; lacerations, pseudoaneurysms, thrombosis and arteriovenous fistulas have been documented as vascular injuries [2]. The mechanism of pseudoaneurysm formation may be traumatic, iatrogenic or infective injury to the arterial wall. The most frequent affected sites are common femoral and superficial femoral arteries but rarely the arteria profunda femoris. This arteria runs deep in the thigh and muscles protect the vessel from external trauma. The signs such as persistent hip pain, thigh swelling, presence of a pulsatile mass and unexplained anemia may suggest the diagnosis [3]. Pseudoaneurysm of APF could be treated with surgical repair, intraarterial catheter techniques or thrombin injection under duplex imaging guidance [1, 4].

The causes of pseudoaneurysm during the proximal femoral fracture surgery are usually related with drilling the hole of plate without using retractor, direct damage of sharp bone spike and inattentive placement of cable wires [1, 2, 8, 9]. In our case, the most possible cause of vascular damage seems to be inattentive drilling of 5th hole of the plate. It should be kept in mind that proper placement of retractors reduces the rates of such complications.

The presenting time of pseudoaneurysm is variable. The signs of pseudoaneurysms can not be clear in the early postoperative period. Minimal arterial wall damage allows only a slow progression in size which brings a delayed presentation even months after the initial injury. Our patient admitted with pain, tenderness, nonpulsatile swelling in the thigh three weeks after the operation. We performed ultrasound for diagnosis, but we just saw a large hematoma in thigh, with no pseudoaneurysm. Duplex ultrasound is a useful tool for accurate diagnosis especially in superficial tissues. But most of the time accuracy of US is not sufficient enough for deeper tissues such as arteria profunda femoris which runs deep in the thigh [4]. For the definitive diagnosis we performed transfemoral intraarterial digital subtractionangiography.

Serious vascular injuries after orthopedic procedures can also be effectively treated by minimally invasive angiographic procedures that are considered to represent the first line of therapy [5, 6]. Also it brings high success rate associated with low morbidity and mortality rates [10, 11]. In our case pseudoaneurysm of arteria profunda femoris has been treated with endovascular embolization successfully.

In conclusion endovascular treatment of pseudoaneurysm after elective orthopedic surgery is a very effective and safe interventional technique. It should be considered as the first option in the treatment of these lesions because of all the advantages of minimal invasive therapy. After this intervention early rehabilitation should be applied for good function. And in the treatment of hip fracture, placement of retractors is very important to avoid vascular injuries.

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