Case Report

A Traumatic Profunda Femoris Artery Pseudoaneurysm and Literature Review

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Abstract

Profunda femoris artery pseudoaneurysms (PFAPs) have been described as an iatrogenic phenomenon, principally following orthopedic procedures and open or closed trauma to the upper thigh, although remain rare. The diagnosis of PFAPs is challenging and often delayed due to the nonspecific manner of the presentation with clinical features including pain, swelling, and unexplained anemia as demonstrated in this case report of a PFAP following a stab injury to the thigh. The use of computed tomography angiography (CTA) or transcatheter angiography allows for early accurate diagnosis and treatment of vascular complications secondary to trauma, especially when there is concern of vascular injury and possible pseudoaneurysm formation in the clinical context.

Key Words: Computed tomographic angiography, profunda femoris artery, pseudo aneurysm

Introduction

Profunda femoris artery pseudoaneurysms (PFAPs) have been described as an iatrogenic phenomenon, principally following orthopedic procedures and open or closed trauma to the upper thigh, although PFAPs remain rare. The diagnosis of PFAPs is often delayed due to the nonspecific manner of the presentation with clinical features including pain, swelling, and unexplained anemia. Diagnosis can be a challenge and requires a high index of suspicion. Imaging modalities can aid in diagnosis, including ultrasound, conventional arteriography, or computed tomography angiography (CTA). While treatment options depend largely on the site and size of the pseudoaneurysm, some authorities believe that the complication rates of even asymptomatic lesions warrant intervention.

We present a case of PFAP following a stab wound to the thigh.

Case Report

A 17-year-old man was brought into the accident and emergency department, having sustained a stab wound to the anterior aspect of the thigh. There was no reported loss of consciousness, and the patient was resuscitated as per advanced trauma life support protocol.

On examination, the only positive finding was a 0.5 cm stab wound on the anterior aspect of the upper third of the thigh just lateral to the mid-inguinal point, with a surrounding hematoma, but no active bleeding. To rule out any injury to the superficial femoral artery, the patient underwent arterial duplex ultrasonography. This confirmed a small hematoma on the anterior aspect of the thigh with no obvious injury to the superficial femoral artery or any other major artery. No pseudoaneurysm was visualized. The patient was scheduled on the emergency list for an exploration of the wound under general anesthetic in the morning following the presentation. Intraoperatively, a small hematoma was evacuated. No active bleeding was noted at the time; the wound was, therefore, washed and packed.

In the following 24 h, the patient continued to bleed necessitating three further dressing changes and clot evacuation. The patient was noted to be clinically anemic and his full blood count demonstrated a significant drop in the hemoglobin level, necessitating transfusion of 3 units. Computed tomography angiography (CTA) was therefore performed to determine the site of blood loss, with a view to embolization or further surgical exploration. The CTA revealed a 1.4 cm × 1.1 cm pseudoaneurysm arising from one of the branches of the
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Access was obtained from the contra-lateral femoral artery and followed by super selective cannulation of the bleeding profunda branch and successful distal coil embolization with a single, soft 3 mm × 3 mm coil that was deployed into the feeding vessel and a satisfactory position was achieved [Figure 2]. Postprocedure angiograms confirmed complete exclusion of the pseudoaneurysm and no further hemorrhage [Figure 3].

Discussion

Profunda femoris artery pseudoaneurysms (PFAPs) have been described as an iatrogenic phenomenon, principally following orthopedic procedures[1] and open or closed trauma to the upper thigh,[2] although PFAPs remain rare.[4] It also occurs in the context of femoral fractures[4,5] or subsequent internal fixation.[6] Since 1964 there have been 61 published cases of pseudoaneurysm following proximal femoral shaft repairs.[7] Published accounts of PFAPs occurring following penetrating trauma are few. One retrospective study focusing on fragment trauma sustained by military personnel showed the profunda femoris was among the least frequently affected vessel while the superficial femoral was most commonly injured.[8] Profunda femoris injuries may result more commonly from stab wounds. In a review of gluteal stab wounds, 17 of the 21 arterial injuries documented were PFAPs.[9]

As in this case, the diagnosis of profunda femoris pseudoaneurysm is usually delayed. Features such as leg swelling, pain, and unexplained anemia may be the only early clues to the diagnosis. Trauma surgeons should, therefore, be aware of this complication and have a high index of suspicion, especially in cases that involve penetrating injuries. Undetected vascular trauma can be present in a nonspecific manner, such as arteriovenous fistulae manifesting as high output cardiac failure.[10]

As demonstrated by this case, early arterial duplex ultrasonography may fail to demonstrate the arterial injury and pseudoaneurysm formation. The diagnosis therefore usually relies on more detailed and selective arterial imaging.

Management of pseudoaneurysms is dependent largely on their location and size. Active intervention is required in larger (>3 cm) and symptomatic lesions. Current therapeutic options include open surgical repair, ultrasound-guided compression, ultrasound-guided thrombin injection, or a transfemoral catheter-based endovascular approach using coil embolization or stent-graft insertion. In this case, the segmental branch feeding the pseudoaneurysm was selectively cannulated and embolized with platinum coils. A postprocedure angiogram confirmed occlusion of the feeding vessel with obliteration of the pseudoaneurysm and no extravasation of contrast.
Conclusion

This case demonstrates both the nonspecific presentation of arterial pseudoaneurysms and the high index of suspicion that is required for vascular injury in cases of penetrating injury. In the case of such injuries, it is not possible to accurately predict both the trajectory of the penetrating object and the precise delineation of the underlying vascular anatomy. Responsible teams, therefore, require a low threshold for investigating these patients, to rule out underlying vascular trauma.

Our experience suggests that duplex arteriography is not adequate to reliably demonstrate pseudoaneurysms of the profunda femoris, which may be more satisfactorily elicited on CTA. Performing transfemoral catheter angiography from the outset allows for diagnosis and treatment, with therapeutic options such as stent graft placement, coiling, or use of other embolic agents to occlude the pseudoaneurysm.

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Conflicts of interest
There are no conflicts of interest.

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