

Infected popliteal artery pseudoaneurysm mimicking knee joint septic arthritis

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Introduction

Infected arterial aneurysms (IAA) are rare. Infected popliteal arterial aneurysm (IPAA) presents with special diagnostic dilemmas. It commonly occurs in males with a male to female ratio of 11:3. Mean age at presentation is 41 years. We report a case 76 year old male who presented with IPAA diagnosed as septic arthritis of the knee joint.

Case

A 76 year old male with a history of diabetes mellitus, hypertension, ischemic heart disease and chronic kidney disease presented with pain and swelling of the left knee joint region for 10 days.

Three weeks prior to the onset of knee pain, he has had fever with chills, abdominal pain, nausea and vomiting. Urine full report had revealed a pyuria. However the urine culture has not grown any organisms. He has had a neutrophilic leucocytosis and an abdominal ultrasound had shown an acute renal oedema in the background features of chronic kidney disease, confirming the clinical diagnosis of acute pyelonephritis. He had been treated with intravenous antibiotics. Following treatment, urinary tract symptoms has settled, with repeat urine pus cells showing a significant decline.

At the current presentation, the examination revealed a tender mass in the medial aspect of the left popliteal fossa with warm overlying skin. There was leg oedema. The left dorsalis pedis and posterior tibial pulses were weak.

Blood investigations showed a leucocytosis of 19.75×10^3 /

μL with neutrophilia. Blood culture did not grow any organisms. Initial ultrasound scan of the popliteal fossa revealed soft tissue oedema with knee joint effusion that was mistaken for a septic arthritis. The popliteal vein was compressed. Due to the soft tissue oedema, the IPAA was missed. An incision and drainage was planned. The knee joint was accessed from the medial side. During the surgery, massive bleeding was encountered. Therefore the procedure was abandoned and an urgent computed tomographic (CT) scan of the lower limb with CT Angiogram was done. CT scan revealed a popliteal artery saccular aneurysm with oedema of the overlying soft tissue suggestive of an IPAA (Fig 1). There was no aneurysm on the contralateral popliteal artery.

The patient was prepared for excision of the infected aneurysm and revascularization. During the surgery, the inflamed area was seen on the medial side of the popliteal fossa. Revascularisation was first done with superficial femoral artery to proximal anterior tibial reversed saphenous vein graft bypass. To avoid the infected area, the graft was tunneled over the anterior thigh, then along the lateral side of the knee joint to the proximal anterior tibial artery. After the bypass was completed, the pseudo aneurysm cavity (IPAA) was entered through the previous incision. The proximal and distal arterial ends were ligated, the infected material was

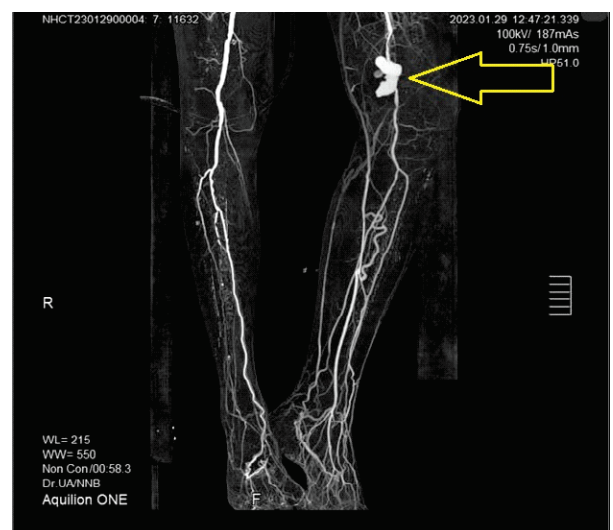


Figure 1. Computed tomographic (CT) scan showing saccular aneurysm

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evacuated and the aneurysm sac was excised and sent for culture and antibiotic sensitivity (Fig 2). The cavity was washed and a negative pressure drain was inserted. Post operatively, a good volume dorsalis pedis and posterior tibial pulses were detected.

Tissue culture revealed a growth of *Pseudomonas aeruginosa*. The patient was treated with intravenous Meropenem and Clindamycin for 6 weeks. At 5 months of follow-up, the patient is well, he is pain free and is able to walk without help. The patient did not have any features of recurrent infections.

Discussion

IPAA is a rare clinical presentation. The infected aneurysms were also called mycotic aneurysms due to its appearance on pathological examination. However during the initial description by Sir William Osler in 1880, the term mycotic aneurysm was used to describe an aneurysm arising as a result of infection of an otherwise normal artery from septic emboli due to infective endocarditis. The original case that was described has occurred following septic emboli from the infected heart valve .

The infection and aneurysm formation of an artery can occur via several mechanisms viz: direct spread from the surrounding infections, septic embolism, infection of an injured endothelium or atherosclerotic plaque or a direct inoculation occurring as a result of trauma or surgery .When the arterial wall is infected, it results in destruction of the wall. Subsequently the artery ruptures, resulting in a false or pseudo aneurysm. Therefore infected arterial aneurysms are false or pseudo aneurysms.

Common bacteria associated with infected aneurysms in the arteries are *Staphylococcus aureus*, *Salmonella* species, *Streptococci viridans* and *Streptococcus pneumonia* . The blood culture was negative in the above mentioned patient but the tissue culture resulted in a growth of *Pseudomonas*



Figure 2. Intra- operative image showing the pseudoaneurysm cavity

aeruginosa. It is known that in patients with infected arterial aneurysms, the blood culture is negative in about 50% of the patients . This is probably due to pre diagnosis antibiotic treatment.

This patient had a urinary tract infection 3 weeks prior to the presentation with IPAA during which, probably the causative organism has entered the blood stream resulting in inoculation of an atherosclerotic plaque in the popliteal artery, resulting in pseudo aneurysm formation. This patient did not have any other sources of septic emboli and there was no history of trauma to the popliteal artery.

IPAA usually present with a painful pulsatile mass in the popliteal fossa. Patients are usually in sepsis with fever tachycardia and tachypnoea. This patient had the above features. However the pulsatility of the mass was difficult to elicit due to the associated tissue edema and was missed in the initial assessment. In addition the dorsalis pedis and the posterior tibial pulses were reduced in volume. The patient had a painful knee joint and was not able to walk. Because of the above mentioned features the patient was diagnosed to have septic arthritis. However there were features against septic arthritis which were not noticed at the initial assessment. The swelling was towards the superio-medial aspect of the knee joint. There were no signs of inflammation on the lateral and anterior aspects of the knee joint. However in septic arthritis the entire joint is inflamed and swollen. The ultrasound scan findings were misleading. Ultrasound scan revealed inflammation of the tissues in the popliteal fossa. Due to the presence of swelling the false aneurysm was not detected. There was a sympathetic effusion within the knee joint. This was misinterpreted as joint effusion due to the septic arthritis. Therefore septic arthritis of the knee joint was diagnosed and the patient was prepared for a knee joint arthrotomy. During the attempted arthrotomy, torrential bleeding was encountered and the procedure was abandoned and the skin incision was closed. A subsequent computed tomographic (CT) scan of the lower limb with CT angiography revealed a saccular aneurysm arising from the supra genicular popliteal artery with surrounding soft tissue inflammation suggesting an infected aneurysm,

The treatment options for IAA in general include ligation and excision of the aneurysm, ligation followed by extra anatomical bypass if the artery is important sources of blood supply e.g. end arteries. Another option is excision of the aneurysm and interposition graft repair with a native vein . Endo vascular option with insertion of covered stent has been tried in IAA in other parts of the body with successful short term outcomes. Data on management of infected popliteal

artery aneurysm with endovascular management is limited to individual case reports with only short duration follow up . In this patient, ligation and excision of the aneurysm and extra anatomical bypass from distal superficial femoral artery to the proximal anterior tibial artery was done. The patient had an uneventful recovery. The tissue culture revealed the growth of *Pseudomonas Aeruginosa*. The patient was started on a prolonged course of (six weeks) antibiotic therapy according to the microbiology advice . At 5 months of follow-up, the patient is well; he is pain free and able to walk without help. He did not have any features of recurrent infections.

Conclusion

IPAA are uncommon, and they present a considerable diagnostic and therapeutic challenge with a suspicion of a vascular cause, If typical clinical features of alternative diagnosis are absent, a CT scan of the lower limb with CT angiogram should be done to exclude a sinister pathology.

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Learning Points:

- Infected popliteal artery aneurysm presents with diagnostic difficulties
- Therefore if there are swelling near the popliteal fossa where there are atypical features, infected popliteal artery aneurysm should be considered as a differential diagnosis
- If there are any unusual features on ultrasound scanning, a computed tomographic scan (CT) should be done to exclude such significant diagnosis.