

Infected Pseudoaneurysm with Necrotising Fasciitis Following Femoral Artery Catheterisation

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ABSTRACT

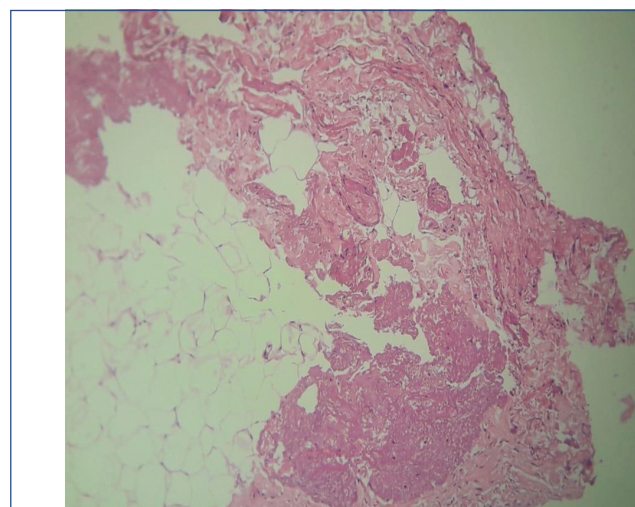
Femoral pseudoaneurysm is the most common complication of femoral artery catheterisation usually diagnosed by colour doppler ultrasound. Ultrasound-guided compression has replaced surgery to be the mainstay of therapy due to its high success rate and low complications. The present case is about a 63-year-old female, who presented with pain and swelling in the right groin. She had undergone coronary angioplasty two weeks back. She developed fever, chills, wound induration and necrosis at the puncture site. A laboratory study revealed leucocytosis, elevated Erythrocyte Sedimentation Rate (ESR), and C-Reactive Protein (CRP). Ultrasound doppler showed a 4x2.8x2.7 cm pseudoaneurysm of the right superficial femoral artery with a to-and-fro flow pattern. Computed Tomography (CT) angiogram showed a large narrow neck pseudoaneurysm arising from the anterior wall of the proximal superficial femoral artery just distal to its origin. The right superficial femoral angiogram showed a pseudoaneurysm draining into a large cavity. She underwent an ultrasound-guided thrombin injection of the pseudoaneurysm. A thrombus was formed in the superficial femoral artery after thrombin injection and thrombosuction was done. The necrotic tissue was excised and skin grafting was done after the wound healed.

Keywords: Thrombin injection, To-and-fro flow pattern, Thrombosuction

Femoral artery pseudoaneurysm is defined by an outpouching of one or two layers of the arterial wall. It presents acutely with pain in the groin, pulsatile haematoma and ecchymosis. Chronically a fibrous capsule is formed and a persistent flow communicates with the arterial lumen. Incidence is found to be up to 0.2% of diagnostic and 8% of interventional procedures [1]. Percutaneous intervention of the femoral artery is the predisposing factor for pseudoaneurysm. A pulsatile mass in the access site after a recent intervention provides an important clue to the diagnosis.

A 63-year-old female who underwent coronary angioplasty two weeks back presented with pain and swelling in the right groin. Two weeks later she developed fever, chills, wound induration, and necrosis at the puncture site [Table/Fig-1]. A histopathological examination revealed necrosis [Table/Fig-2]. Laboratory study revealed leucocytosis, elevated Erythrocyte Sedimentation Rate (ESR) and C-Reactive Protein (CRP). Ultrasound (USG) doppler showed a 4x2.8x2.7 cm pseudoaneurysm of the right superficial femoral artery [Table/Fig-3] with a to-and-fro flow pattern [Table/Fig-4]. Computed Tomography (CT) angiogram showed a large narrow neck pseudoaneurysm arising from the anterior wall of the

proximal superficial femoral artery just distal to its origin [Table/Fig-5]. The right superficial femoral angiogram showed a pseudoaneurysm draining into a large cavity (Video 1).



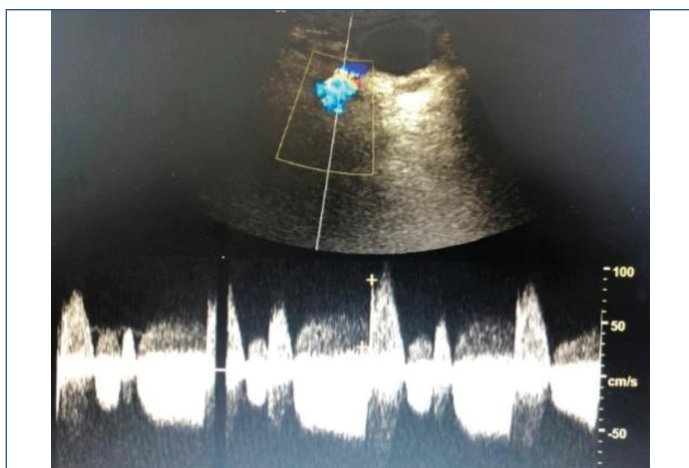
[Table/Fig-2]: High power histopathology image using haematoxylin and eosin stain showing fibroadipose and fibromuscular tissue with areas of necrosis.



[Table/Fig-1]: Right groin access site showing localised swelling with erythematous, necrotic areas.



[Table/Fig-3]: Gray-scale ultrasonography image showing well-defined anechoic cystic mass.

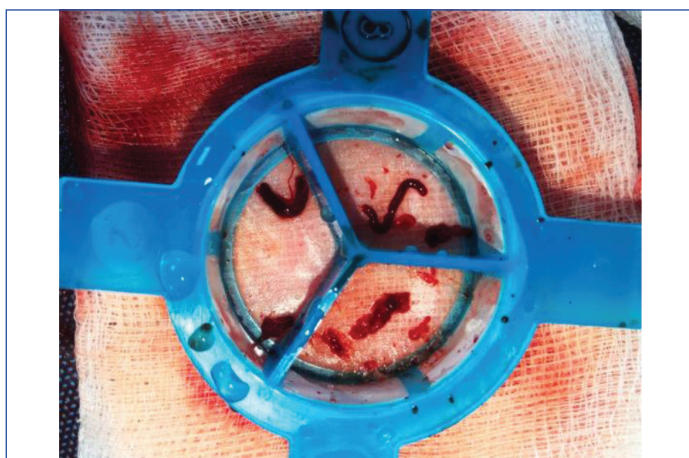


[Table/Fig-4]: Pulse doppler: to-and-fro flow pattern representing the arterial blood entering the cavity in systole and exiting in diastole.



[Table/Fig-5]: CT angiogram showing well-defined round structure filled with contrast material.

She underwent an ultrasound-guided thrombin injection to the superficial portion of the pseudoaneurysm. Ultrasound-guided thrombin injection is a minimally invasive technique done using local anaesthesia. Pseudoaneurysm should have a long and narrow neck for thrombin injection. A thrombus was formed in the superficial femoral artery after thrombin injection and thrombosuction was done [Table/Fig-6]. Open surgical repair was done with the necrotic tissue being excised and skin grafting was done after wound healing [Table/Fig-7]. Her pain and swelling resolved after three months with good wound healing [Table/Fig-8]. Routine investigations revealed normal White Blood Cell (WBC) count, ESR and CRP.



[Table/Fig-6]: Multiple thrombi formed after thrombin injection was aspirated using a thrombus aspiration catheter.



[Table/Fig-7]: Necrotic areas were excised and skin grafting was done 1 month after the presentation.



[Table/Fig-8]: Healed groin access site after two months of follow-up.

Pseudoaneurysm occurs after femoral artery catheterisation, blunt or penetrating trauma, tumour invasion, vasculitis, Behcet syndrome, liver transplantation, and heart transplantation. It presents with a pulsatile mass, tenderness and femoral bruit. Risk factors include intake of anticoagulants, larger sheath size, low puncture site, platelet count below 200,000 cells/mm³, obesity, female sex, hypertension, arterial calcification, age >75 years, and emergency procedures. Compression of the neurovascular structures can lead to ischaemia, neuropathy, venous thrombosis, and overlying skin necrosis [2].

Small sized pseudoaneurysms (<2 cms) which are non expanding can often be managed conservatively. Ultrasound-guided thrombin injection is ideal when there is a long and narrow neck. A spinal needle is inserted into the sac under continuous visualisation and thrombin is injected into it. Distal embolisation can occur in 2-4% of the cases and a forgaty catheter is used to remove the distal embolus.

Thrombin injection is not feasible in the presence of multilobed pseudoaneurysm, local infection, and arteriovenous fistula [3]. Side-effects of the USG-guided compression include long procedure time,

the high recurrence rate in patients with anticoagulant therapy, and pain during compression. Complications like a vasovagal response, rupture, deep vein thrombosis, and angina can happen. VASCADE vascular closure system has a bioabsorbable extravascular collagen able to achieve haemostasis using an expandable extravascular disc. Absence of endovascular component eliminates the risk of embolisation which causes acute limb ischaemia [4,5].

Surgery is indicated in patients with rapid expansion, infection, skin necrosis, failure of other treatment modalities, and compressive syndromes like neuropathy, claudication or critical limb ischaemia [6]. Evacuation of the haematoma followed by a simple suture or a surgical repair with a patch is usually done [1].

Differential diagnoses include haematoma, retroperitoneal haematoma and femoral arteriovenous fistula. Retroperitoneal haematoma results from a high femoral puncture and the diagnosis is usually delayed because a large amount of blood gets rapidly accumulated before the symptoms appear [7,8]. Arteriovenous fistula results from a puncture to both an artery and a vein leading to direct communication. Clinically it manifests with a palpable thrill and loud bruit over the site [9].

To conclude, low femoral artery puncture is a risk factor for femoral artery pseudoaneurysm. Early detection and manual compression with ultrasound doppler avoid this grave complication. USG-guided

thrombin injection is suitable for a pseudoaneurysm with a long and narrow neck.

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