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Case Report

New Treatment Technique by Vascular Closure Device for a Large Iatrogenic Femoral Artery Pseudoaneurysm. A Case Report

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Abstract

The iatrogenic large femoral artery pseudoaneurysm is rare condition. Generally, was caused at the puncture site of the right or left groin after coronary angiography and/or intervention. Manual compression for few hours was administrated but failed then balloon tamponade via contralateral anterograde was attempted over 10 minutes for hemostasis at the neck of pseudoaneurysm site but hemostasis was not achieved. Next, contralateral anterograde from left femoral artery approach was use to cross the wire from the neck of the pseudoaneurysm and ipsilateral retrograde approach from right femoral by direct puncture of the neck of pseudoaneurysm was tried. A 0.014-inch guidewire was crossed from the neck of the pseudoaneurysm to the right external iliac artery. The wire was replaced with a 0.035-inch guidewire. A star close device was inserted and deployed at the neck of the pseudoaneurysm. Final angiography revealed totally occluded of the pseudoaneurysm neck without complication.

Keywords: iatrogenic femoral artery pseudoaneurysm; star close device

Introduction

Femoral artery access is the most common puncture site for diagnostic coronary angiography, therapeutic coronary intervention, peripheral angiography, peripheral angioplasty, transcatheter aortic valve implantation, aortic balloon valvuloplasty and alcohol septal ablation. However, puncture site complications, such as Fistula, bleeding, hematoma and pseudoaneurysm may occur. [1]. Pseudoaneurysm is the most common femoral access complication with incidence rate ranges from 0.2% to 8% [2]. Risk factors for pseudoaneurysm include antiplatelet agents, anticoagulants, larger sheath size, puncture site below common femoral artery, and emergency procedures.

Symptoms may include groin swelling, unusual pain, bruising, skin changes, neuropathy and, rarely, limb ischemia or claudication from embolization or arterial compression. Rupture rare but can be associated with severe pain and hemodynamic instability. The most common nonsurgical treatment options are duplex ultrasound-guided compression, duplex ultrasound-guided sealing pseudoaneurysms of the femoral artery with saline injection and duplex ultrasound-guided thrombin injection, which are widely used and fairly successful [3]. However, a novel approach with suture-based closure devices to treat pseudoaneurysms was recently reported in few cases [4] We use new technique by using star close device with hybrid contralateral and ipsilateral approach to close the neck of the femoral pseudoaneurysm. obtained informed consent of the patient for publication of this case report.

Case report

A 42-year-old male who underwent diagnostic coronary angiography with no obstructive disease found. he was discharged home on the same day but returned to the hospital for symptoms include groin swelling, unusual pain, bruising, skin changes, neuropathy from femoral nerve compression and claudication from arterial compression. On examination pulsatile mass in his right groin with a bruit. Angio CT suggested large pseudoaneurysm 7x8 cm in right femoral artery (figure1). Angiography to his right common femoral artery revealed large pseudoaneurysm (2). With a contralateral sheath placed in the left common femoral artery, the pseudoaneurysm was entered through the neck using 0.014 inch coronary wire. A micro introducer needle was then used to enter the pseudoaneurysm A 0.014-inch wire was then advanced through the neck of the pseudoaneurysm retrogradely into the external iliac artery. The micro introducer sheath was then advanced into the pseudoaneurysm over the wire and retrogradely into the external iliac artery. The 0.014-inch wire was exchanged with a 0.035-inch Whole wire. The star closure device was then deployed with the anchor against the pseudoaneurysm neck with subsequent thrombosis of the pseudoaneurysm (figure 3). Control Angiography through the contralateral sheath showed complete occlusion of the neck with no compromise to the common femoral artery. The patient was discharged home 6 h after the procedure and was asymptomatic on follow-up

Figure 1 : CT angiography: large pseudoaneurysm in right femoral artery

Figure 2: Selective angiography: pseudoaneurysm in right femoral artery

Figure 3 : after star close deployment, totally occlusion in pseudoaneurysm neck

In this case, a novel approach to close an iatrogenic pseudoaneurysm using the star closure device. This alternative method is likely to be useful in the setting of a large pseudoaneurysm (> 3 mm) with a neck diameter less than 5 mm.

The Alshifa Hospital new technique of treatment for femoral artery pseudoaneurysm involved 4 steps to closure the neck of femoral artery pseudoaneurysm.

1.contralteral anterograde via 3.5,6 French right Judkins guiding catheter 0.014-inch wire insertion into the femoral artery pseudoaneurysm. A contralateral vascular access remains necessary for this technique, because fresh pseudoaneurysms have no resistant walls and bleeding into the surrounding tissue starts as soon as they are punctured. In case of difficult wiring or significant bleeding the iliac artery can be temporary occluded with a balloon through the contralateral access (figure 4)

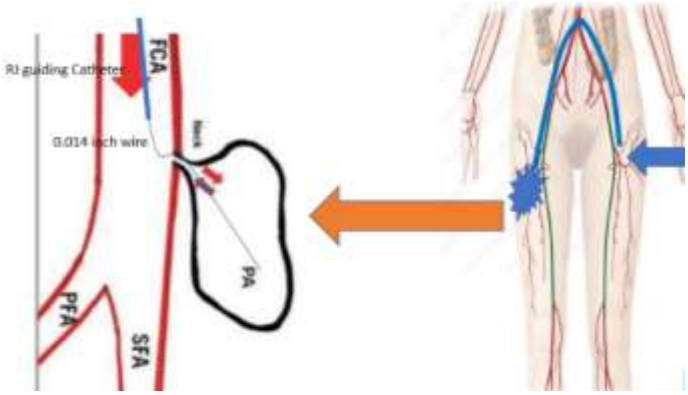

Figure 4: SFA: superficial femoral artery, PFA: deep femoral artery, FCA: Common femoral artery, PA: Pseudoaneurysm

2. ipsilateral retrograde via direct puncture (or catch with snare) 0.014-inch wire insertion into the external iliac artery through neck of pseudoaneurysm (figure 5)

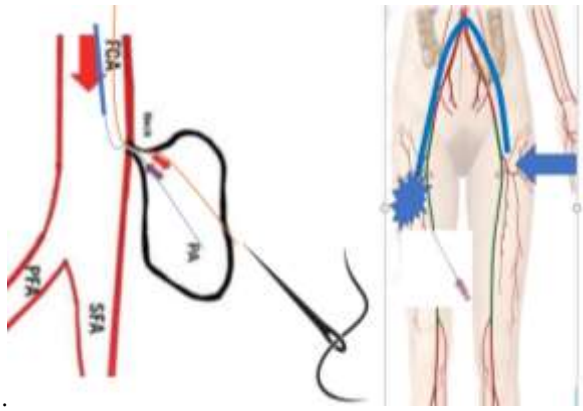

Figure 5: ***SFA: superficial femoral artery, PFA: deep femoral artery, FCA: Common femoral artery, PA: Pseudoaneurysm***

3.The 0.014-inch wire was exchanged with a 0.035 inch Whole wire. The introducer sheath was then advanced into the pseudoaneurysm over the wire and retrogradely into the external iliac artery (figure6)

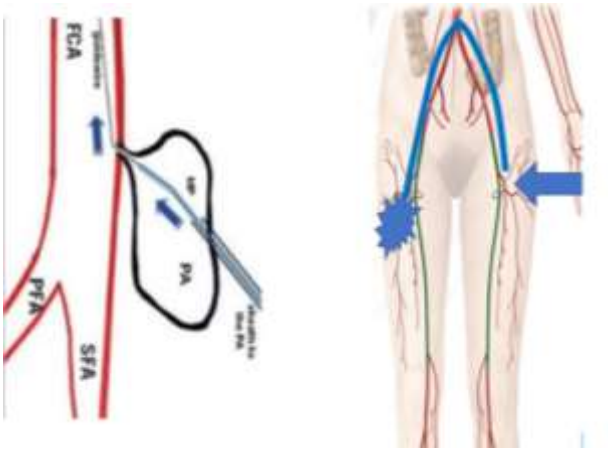

Figure 6: SFA: superficial femoral artery, PFA: deep femoral artery, FCA: Common femoral artery, PA: Pseudoaneurysm

4.The (star close device/or Angio cell device) was then deployed with the anchor against the pseudoaneurysm neck with subsequent thrombosis of the pseudoaneurysm (figure 7)

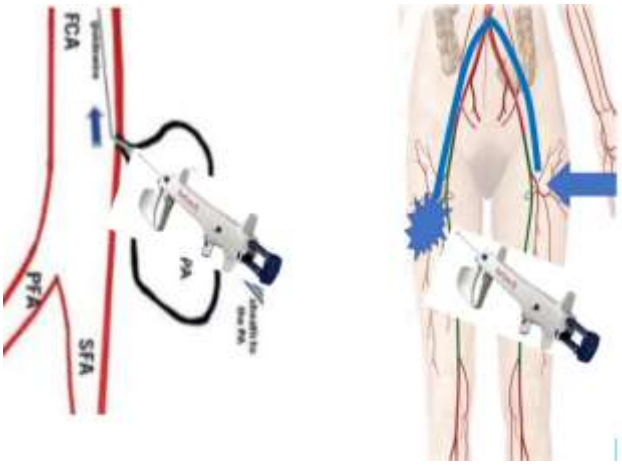

Figure 7: SFA: superficial femoral artery, PFA: deep femoral artery, FCA: Common femoral artery, PA: Pseudoaneurysm

Discussion

Femoral artery pseudoaneurysm is the most common complication of coronary and peripheral intervention. the incidence of pseudoaneurysm at 0.2% to 0.5% following diagnostic procedures and up to 8% following procedures with an intervention [2]. Conservative management is an option for some patients with small femoral artery pseudoaneurysms.

ultrasound-guided compression was used to treat pseudoaneurysms, replacing surgical procedures for many pseudoaneurysms and reporting an early success rate of 63% to 88%. [4]. Ultrasound-guided thrombin injection has replaced ultrasound-guided compression in most practices. Injection has a success rate of 93% to 97%, compared with 63% to 88% for ultrasound-guided compression. Complications of ultrasound-guided thrombin injection are rare (1.2%), with the most common being distal embolization (0.5%). [5]

Patients with large hematomas resulting in compressive symptoms such as neuropathy or ischemia and infected pseudoaneurysms are best treated with surgical repair. Surgical treatment carries a significant complication rate of 20%. [6]

Our new technique has several advantages. high success rate and the most patients who are currently undergoing treatment with oral anticoagulants and antiplatelet agents can be successfully treated because the vascular closure device is effective independent of concomitant medications. However, we believe that this technique may be superior to thrombin injection because potential complications that might occur with thrombin injection, such as peripheral embolism of thrombin or anaphylactic reactions, are avoided, and it is less invasive than open repair.

To best of our Knowledge this technique demonstrates the safety and efficacy to treat iatrogenic femoral artery pseudoaneurysm by using (contralateral anterograde and ipsilateral retrograde approach) step by step is first time reported in this case . Previous few case reports had described the use of Angio -seal (4 cases) or star close device (one case) but by direct puncture of the pseudoaneurysm [7-10]. However, Further trials are warrantee with a prospective design and a larger cohort of patients

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