

CASE REPORTS

Ultrasound-guided compression repair (UGCR) of peripheral artery pseudoaneurysm: a simple technique with rewarding outcome

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Introduction

Post catheterization pseudoaneurysm, a rare complication has dramatically increased now a days due to the advances and increasing frequency of endovascular intervention. Ultrasound guided compression repair is the first line treatment of choice for post catheterization femoral artery pseudoaneurysm. Ultrasound guided manual compression and obliteration of the neck induces thrombosis and successfully converts the pseudoaneurysm to a hematoma. It is simple, safe and effective. Understanding the procedure and mechanism is the mainstay of success in this treatment that can be routinely done as outdoor basis.

Case report

A 54 years old male of CKD, diabetes, hypertension, IHD and s/p PCI to LAD and LAX was admitted in our hospital and undergone CAG with Plain old balloon angioplasty (POBA). Following that he developed a pulsatile swelling in the groin at the puncture site. Three weeks later he attended the Radiology and Imaging

department for Doppler study of lower limb vessels to evaluate the swelling and diagnosed as pseudoaneurysm of common femoral artery just proximal to its bifurcation. Size measures about 4.0 cm x 2.6 cm x 3.4 cm, and a volume of 19.5 cc with neck/tract about 2.8 mm in diameter and 14.6 mm in length. After consulting with the primary physician, counselling the patient and taking proper consent gradual compression was applied at the neck using colour doppler ultrasound (CDU) until colour flow with in the pseudoaneurysm and the tract disappeared completely while femoral flow remains unobstructed.

Steady pressure was maintained for 15 minutes without picking the probe. After two sessions of compression, the cavity was replaced by echogenic hematoma. No colour flow was identified after 1, 2 and 5 minutes of compression and 6 hours later. Three days later he attended for follow up scan. There was no evidence of recurrence or any other complication and time interval regression of the size of hematoma noted.

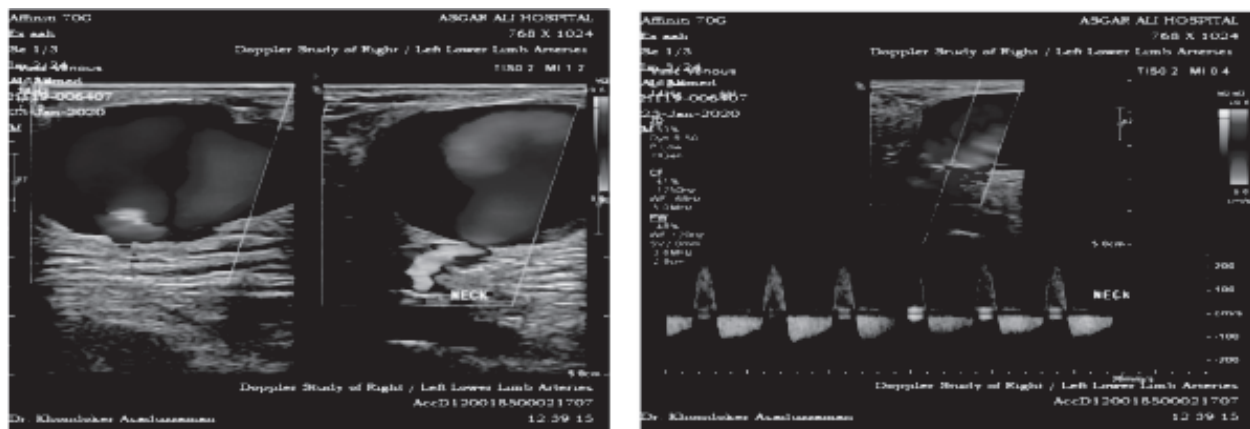


Fig.-1. Doppler ultrasound showing the pseudoaneurysm with neck connecting the common femoral artery.

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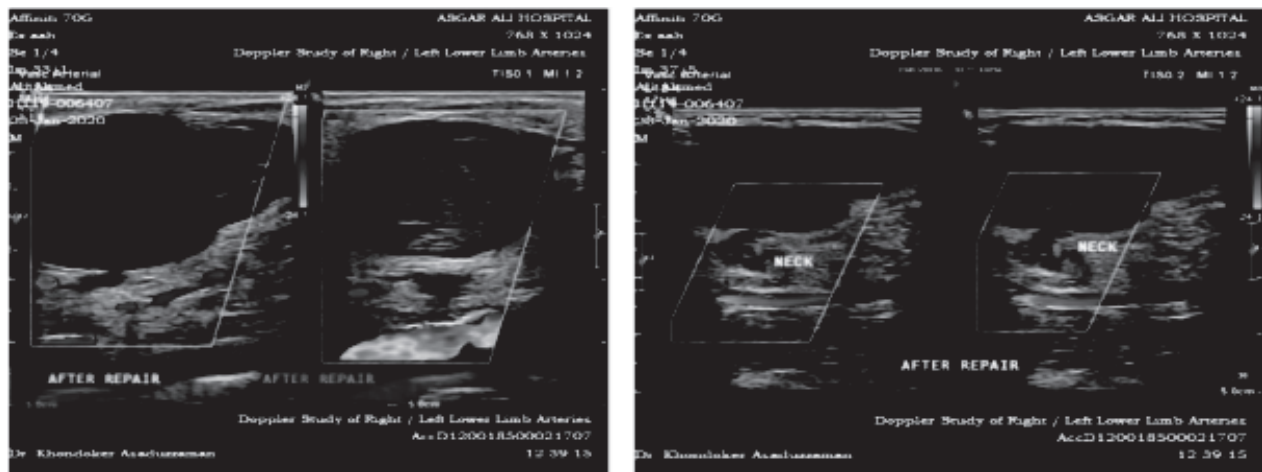


Fig.-2: Five minutes after compression. Cessation of flow with in the neck and pseudoaneurysm.

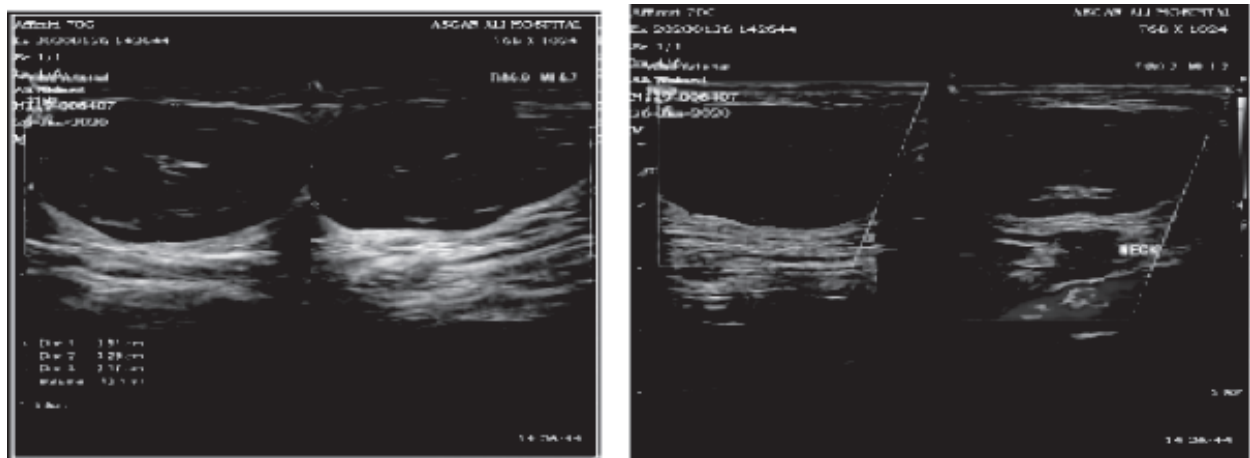


Fig.-3: Three days after repair. Time interval regression of hematoma with no evidence of recurrence.

Discussion

Post angiographic femoral artery pseudoaneurysm is a rare complication with a reported frequency of 0.05-0.5 percent^{1,2}. The rate of incidence of this complication has been increasing that may be as high as 6-8% with the growing use of large diameter sheaths and more potent anticoagulant regimens^{2,3}. A pseudoaneurysm consists of a false lumen connected to a supplying artery by a neck/tract. Rupture of pseudoaneurysm leading to catastrophic bleeding is a potential complication. The other sequel includes pain, progressive enlargement, infection, skin necrosis, compression neuropathy, and distal limb ischemia.

Surgery had been the traditional approach for repair of the peripheral pseudoaneurysm. Although surgery is effective, it is relatively expensive and carries particular risks for patients with coronary artery disease. A complication rate of approximately 20% had been reported, with risks including bleeding (7.4%), neuralgia (5.2%), and death (2.1%)^{4,5}. Moreover, patients with groin hematomas may have poor healing of the surgical site, leading to prolonged hospitalization and delayed ambulation⁶. Percutaneous endovascular management approaches of the peripheral pseudoaneurysm include the following: (a) Trans-catheter coil embolization of the aneurysm sac,

whose potential limitations include increasing pressure in a cavity that does not have a true wall as well as the formation of a potential focus of infection⁷ and (b) Stent-graft placement across the pseudoaneurysm neck, thus excluding it from arterial circulation. Additional limitations of the procedure include its high cost, unfavourable vessel anatomy, potential fracture of the stent at a site of mobility near the hip, and inability to reuse the groin for future access⁸.

Ultrasound guided thrombin injection is currently the method of choice in many centres because of its ease, rapidity, minimal discomfort and successful thrombosis of the femoral artery pseudoaneurysm occurring at a rate between 86% and 100%. But the use of thrombin, a bovine or human serum preparation, is not free from potential risks of allergic sensitization and development of antibodies to thrombin with the resultant potential of bleeding complications and possible infectious transmission⁹. Besides, human or newer recombinant thrombin is expensive and/or an off label use for this purpose. On the contrary, Obliteration of the track of the pseudoaneurysm only by manual compression and cessation of the blood flow induces thrombosis; facilitate the formation of a haemostatic plug and sequential conversion to a simple haematoma which will ultimately resolve spontaneously. The method is simple and effective with a reported success rate ranging from 71% to 93%¹⁰⁻¹⁴. Although the success rate relates closely to the size, thrombogenicity and morphology of the track, study suggests that technical success for pseudoaneurysms with a largest dimension of 4 cm are more². The chronicity of a pseudoaneurysm will decrease the thrombogenicity of the track due to the development of endothelium. Longstanding pseudoaneurysm, more than one month old, has previously been regarded as untreatable, while a long and narrow track is easier to close than a short, broad one¹⁰.

UGCR is a time-consuming procedure, operator fatigue is a critical factor, while some authors consider that a compression device may increase the success rate appreciably^{11,15}. The acuity of the

pseudoaneurysm and the tolerance of the patient also contributed to the success rate¹⁶.

Ultrasound-guided compression repair of pseudoaneurysm is a safe, effective and non-invasive treatment that should be attempted before resorting to endovascular or open surgical alternative.

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