

Case Report

Case study successful use of stent graft in post-catherization massive pseudoaneurysm of femoral artery with wide neck

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ABSTRACT

Pseudoaneurysms are not rare and can occur due to varied reasons including percutaneous vascular access. If left untreated, pseudoaneurysms can be fatal. Here, we have presented a classic case study where a large pseudoaneurysm of left femoral artery with very wide neck was closed using stent graft. A 55 years old male was presented with severe painful large mass in left groin. The mass was soft tissue swelling with severe tenderness and pulsatile in nature. The doppler suggested it to be filled with blood and communicating with femoral artery hence diagnosed as pseudoaneurysm. Attempt was made to compress the neck which was large not clearly defined, hence failed. Multiple interventional and surgical options of closure of pseudoaneurysm was discussed. Patient was taken for stent graft deployment in cath lab. Check angiogram showed nicely flowing femoral artery with no signs of pseudoaneurysm. The patient immediately improved with decrease in pain and swelling.

Keywords: Angiography, Peripheral, Pseudoaneurysm, Stent

INTRODUCTION

Pseudoaneurysm of the vessels, occurs when a blood vessel wall is injured and the leaking blood collects in the surrounding tissue forming a space which is connected with the main vessel through a neck with to and fro movement of blood. Clinically it is characterised by pulsatile tender swelling with rub and continuous murmur on auscultation. It is different from true aneurysm in which arterial vessel wall weakens and forms a sac. Pseudoaneurysm is usually caused by a penetrating injury to the space outside the vessel wall communicating with the lumen. It may be pulsatile and severely tender. Trauma and cardiac catheterization are one of the most common reason for pseudoaneurysm. The incidence of pseudoaneurysm after diagnostic catheterization ranges from 0.05-2%.¹ Pseudoaneurysms may complicate up to 0.8% of vascular interventional procedures.² Small pseudoaneurysms can spontaneously clot, while others need definitive treatment. Factors which increase the propensity to develop pseudoaneurysm during cardiac

Cath lab procedure includes elderly age, small height, female sex, and associated connective tissue disorder, improper compression following sheath removal, prolong procedure, multiple procedure from same sight, use of wide or high French sheath, use of anticoagulants and antiplatelet medications etc. The diagnosis should be suspected if the patient has a history of arterial trauma. This can include arterial access for catheterization i.e., the common femoral artery (CFA), blunt trauma (i.e., to an extremity), or penetrating trauma (i.e., gunshot or blast injury). A patient with such a history who presents with a painful, pulsatile, tender mass at the site of catheterization or trauma should be suspected to have a pseudoaneurysm. The advent of new radiologic techniques with a greater sensitivity for asymptomatic disease has allowed more frequent diagnosis of pseudoaneurysms. Conventional angiography remains the standard of reference for diagnosis but is an invasive procedure, and non-invasive diagnostic modalities e.g., ultrasonography (US), computed tomographic angiography are frequently used for diagnosis. Here, we

present a classic case of pseudoaneurysm in a 55-year-old male with history of femoral artery catheterisation.

CASE REPORT

A 55 years old male was admitted with severe painful tender pulsatile swelling in left groin. He had a history of left femoral artery catheterization few weeks back. Doppler done was suggestive of large soft tissue swelling filled with blood and communicating with femoral artery (Figure 1). Hence, the diagnosis of pseudoaneurysm was made. The swelling was large and the neck of the swelling was very wide and diffuse. As the swelling was already there for more than 2 weeks, it was unlikely to be closed by local compression with ultrasound probe. Possibility of intra lesion thrombin injection was also thought of, however considering the size of swelling and wide neck of pseudoaneurysm, it was considered a risky procedure. Large dose of thrombin solution would have been required and wide neck could also lead to spillage of thrombin into the femoral artery causing life threatening complications. Hence, after discussing with relatives, patient was taken for deployment of stent graft in Cath lab. The procedure was approached from right femoral artery using 6F long sheath and 6F Judkins JR 4 catheter. The angiogram of left femoral artery showed larger pseudoaneurysm of size 82x60 mm with undefined wide neck with free torrential flow communicating with femoral artery just after profunda femoral artery (Figure 1).



Figure 1: The angiogram of left femoral artery showed larger pseudo-aneurysm of size 82x60 mm with undefined wide neck.

6F sheath was replaced with 9F sheath. O16 Fielder FC wire and O35 Amplatz extra stiff wire was used. Fielder FC wire was parked in Profunda femoral artery to mark its origin and avoid its pinching. The left SFA at the site of neck of pseudoaneurysm was stented with 10x40 mm BARD fluency plus vascular self-expanding stent graft (Figure 2).

Post dilatation was done with BARD universe 10x40 mm balloon at 8 atm (Figure 3).



Figure 2: Neck of the pseudoaneurysm was stented with a 10x40 mm BARD fluency plus vascular self-expanding stent graft.

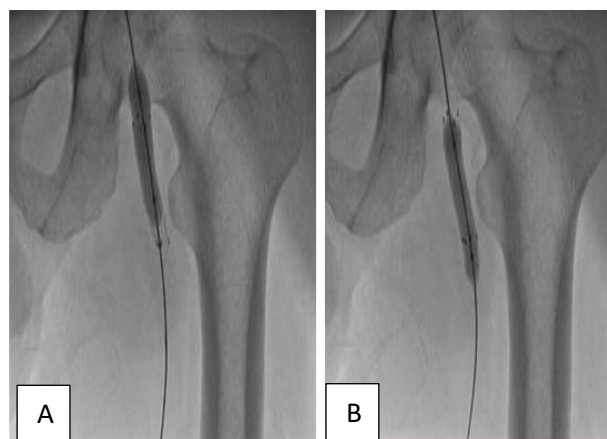


Figure 3: Post dilatation was done with BARD universe 10 x 40 mm balloon at 8 atm.

Check angiogram showed completely occluded pseudoaneurysm with no flow into it (Figure 4).

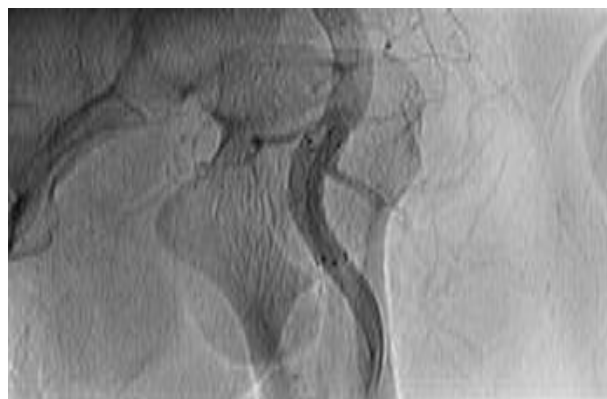


Figure 4: Check angiogram showed completely occluded pseudo aneurysm with no flow into it.

Patient remained haemodynamically stable and tolerated the procedure well. Figure 5 shows visual changes before and after stent graft implantation.

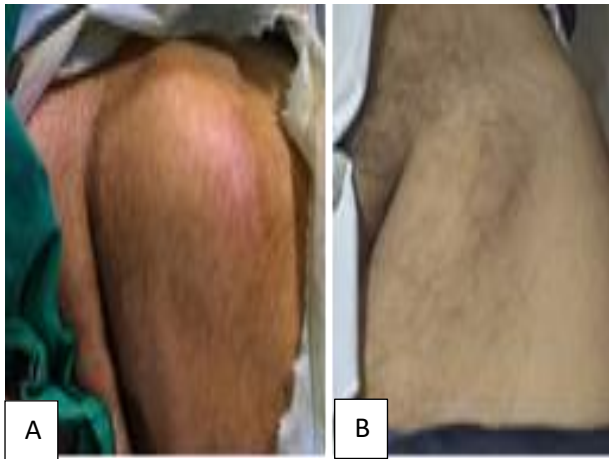


Figure 5: (A) before stent graft procedure (B) after stent graft procedure.

DISCUSSION

While surgery was the gold-standard treatment in the past, several less invasive treatment options are popular today. One of the most common mode of treatment is ultrasound probe compression of the neck of the pseudoaneurysm. The ultrasound probe can be pushed firmly against the patient's skin to compress the neck of the pseudoaneurysm for usually about 20 minutes. During this time, the blood within the pseudoaneurysm clots; after that the probe is removed, the pseudoaneurysm should hopefully remain clotted and should not continue to expand. The procedure may be stopped early due to patient discomfort. It is less successful if the patient is obese. It is also less successful if the neck of the pseudoaneurysm is wide, since it is less likely to clot off during the period of compression. Finally, it is also much less successful if the patient is taking aspirin, warfarin (Coumadin), or another anticoagulant, since these would prevent clotting of blood within the pseudoaneurysm. Late presentation of pseudoaneurysm after a week also makes it less likely to be closed using compression method.³

Another popular, minimally invasive technique used today is ultrasound-guided thrombin injection. Under ultrasound guidance, thrombin can be injected directly into the pseudoaneurysm causing it to clot. Advantages are that the technique is relatively easy to perform, is successful, and is minimally invasive. If there is an arteriovenous fistula (communication between an artery and vein), in addition to the pseudoaneurysm, this technique cannot be employed. This occurs with about 10% of pseudoaneurysms.⁴

Open surgery may also be performed to remove pseudoaneurysms or to prevent them from expanding. If the artery is small and "expendable", then the artery supplying the pseudoaneurysm may be ligated both proximally and distally to the pseudoaneurysm. The pseudoaneurysm may or may not be removed. If the

tissues supplied by the artery does not have sufficient collateral flow (the artery is not expendable), then a vein or synthetic graft would have to be anastomosed proximally and distally to allow for continued blood flow around the pseudoaneurysm. However, it is more invasive (a large skin incision is necessary), and there is more post-operative pain and a risk for wound infection. One of the less invasive options may be preferred in a patient with many co morbidities, who is at high risk for surgery.⁵ Finally, as the pseudoaneurysm communicates with an artery through a hole in the arterial wall, a covered stent may be placed endovascularly across this hole to "exclude it," or to prevent it from receiving blood flow from the artery. The covered stent is composed of metal and is covered with polytetrafluoroethylene (PTFE) or another sterile fabric-like material. The covered stent remains in place permanently, and the pseudoaneurysm, without a continuous flow of arterial blood, then thromboses. Complications include covered stent migration, persistent leakage of blood into the pseudoaneurysm, fracturing (breaking) of the stent, and infection of the stent or of the arterial insertion site.

CONCLUSION

Femoral artery pseudoaneurysm is not an uncommon vascular complication following diagnostic or interventional cardiac catheterization and probably will increase. Multiple therapeutic options are available with various success rates depending upon the duration of pseudoaneurysm and its complexity, which includes the size and neck configuration. Use of stent graft is an efficient alternative, which causes pseudoaneurysm to cut off totally from femoral and immediate symptomatic relief for the patient. Its easy procedure in the hands of expert with less technical expertise. Expected result of procedure is almost 100 percent.

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REFERENCES

1. Webber GW, Jang J, Gustavson S, Olin JW. Contemporary management of postcatheterization pseudoaneurysms. *Circulation*. 2007;115(20):2666-74.
2. Kassem HH, Elmahdy MF, Ewis EB, Mahdy SG. Incidence and predictors of post-catheterization femoral artery pseudoaneurysms. *Egyptian Heart J*. 2013;65(3):213-21.
3. Saad NE, Saad WE, Davies MG, Waldman DL, Fultz PJ, Rubens DJ. Pseudoaneurysms and the role of minimally invasive techniques in their management. *Radiographics*. 2005;25(1):S173-89.
4. Spotnitz WD. Fibrin sealant the only approved hemostat, sealant, and adhesive—a laboratory and clinical perspective. *International Scholarly Res Notices*. 2014;2014.

5. Kouvelos GN, Papas NK, Arnaoutoglou EM, Papadopoulos GS, Matsagkas MI. Endovascular repair of profunda femoral artery false aneurysms using covered stents. *Vascular*. 2011;19(1):51-4.

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