Case Report

Pseudoaneurysm of Femoral Artery Associated with Iatrogenic Arteriovenous Fistula

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Introduction

In endovascular procedures, whether diagnostic or interventional ones, the most common site of arterial access is the femoral artery¹. Currently, the frequency of these procedures has been increasing, but without resulting in an increased incidence of post-procedure complications¹. The main complications include arterial pseudoaneurysm, hematoma, infection, and arteriovenous fistula¹, significantly increasing the morbidity of these patients. Treatments may be conservative, or invasive procedures, whether surgical, percutaneous, both for pseudoaneurysms and for arteriovenous fistulas. The simultaneous occurrence of PSA and AVF is an extremely rare condition². It has been rarely reported in the literature.

The objective of this study is to report a case of femoral pseudoaneurysm with arteriovenous fistula associated after endovascular procedure and its therapeutic approach.

Case Report

This study reports the case of a 68-year-old patient, male, affected by systemic arterial hypertension and type 2 diabetes mellitus, who underwent ablation for atrial fibrillation, with right femoral artery puncture for the procedure. One week after the puncture, the patient developed hematoma and discomfort in the right femoral region. Color Doppler Ultrasound (CDU) revealed a large pseudoaneurysm (PSA) on a superficial femoral artery whose neck was approximately 0.5 cm (Figure 1) associated with arteriovenous fistula (AVF) between the superficial femoral artery and vein with two fistulous orifices. The proximal one was about 3 cm from the femoral bifurcation (Figures 2 and 3).

The patient was assessed by the surgery team that considered him unfit for surgery due to heart condition and use of anticoagulants. As the PSA was deeper, large and had a broad neck, treatment with thrombin injection guided by CDU was chosen to close the PSA. At the end of the procedure, mixed materials (hypo and hyperechoic) was found inside, with no flow to the CDU (Figure 4). Compression bandaging was made and the patient was sent to the ward. A new echography was performed, which confirmed the success of the procedure. The patient was discharged on anticoagulation drugs.

To manage the AVF, clinical follow-up was chosen, as spontaneous closure was expected. After a three-month follow-up, there was no regression of AVF. Percutaneous treatment was chosen for correction purposes. Through the left femoral retrograde access (contralateral access), an aorta crossover was made and angiography was performed at the said site. Arteriography corroborated the CDU findings: two fistulous orifices in superficial femoral artery. The orifices were crossed over using MP catheter and 0.035” guide wire and stenting was performed in the superficial femoral artery, occluding the fistula holes (Figures 5 and 6). The deep or common femoral artery was not affected. Control angiography showed occlusion of the fistula and patency of the stent. The patient recovered uneventfully and was discharged on the first day after the procedure.

The patient was referred for outpatient control with an assistant doctor and after 5 months of monitoring, the stent remained pervious, with complete resolution of the arteriovenous fistula.

Keywords

Hypertension; Diabetes Mellitus; Aneurysm, False; Femoral, Artery/lesions; Arteriovenous Fistula.

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Case Report

Figure 2 – Pulsed Doppler showing pattern compatible with arteriovenous fistula.

Figure 3 – Color Doppler in longitudinal section showing 2 arteriovenous fistulas (AVF) between the superficial femoral artery (SFA) and the superficial femoral vein (SFV). CFV, common femoral vein.
Case Report

Discussion

Pseudoaneurysm and arteriovenous fistulas are complications of endovascular procedures. The incidences of these complications are from 2 to 8% and <1%, respectively. The presence of femoral pseudoaneurysm concomitant with iatrogenic arteriovenous fistula is rare and its incidence is unknown. The main risk factors for complications after endovascular procedures are age, female sex, coronary angioplasty, low arterial puncture, use of anticoagulants and antiplatelet agents and the doctor’s puncturing experience.

Diagnosis of pseudoaneurysm and arteriovenous fistula is based on clinical history and physical examination, and it is confirmed by CDU. The most common clinical findings are pain and edema in the groin area after endovascular procedure, both in pseudoaneurysms and in arteriovenous fistulas. Physical examination may reveal murmur, pulsatile mass and pain in the puncture area. The patient presented hematoma and discomfort in the right femoral region after right femoral artery puncture for a procedure. On physical examination, the patient presented murmur in the right femoral puncture site and reduced pulse in the right lower limb, leading to the suspected presence of pseudoaneurysm and arteriovenous fistula.

The main complication of pseudoaneurysm is rupture, which is related to the size of the aneurysm sac. Other complications can be persistent pain and swelling around the affected area, distal embolization, skin ischemia and necrosis, infection and compression of adjacent vessels and nerves. The
The occurrence of femoral pseudoaneurysm associated with iatrogenic arteriovenous fistula is extremely rare. Treatment with thrombin injection and fibrinogen guided by femoral pseudoaneurysm ultrasound concomitant with arteriovenous fistula is possible, effective and safe, as long as the procedure is correctly performed. Percutaneous treatment with coated stenting in the arteriovenous fistula is also safe, effective and minimally invasive. Management in these cases should always be individualized, seeking the best treatment option.
Authors’ contributions

Research creation and design: Azevedo ACCA, Barros MVL.
Data collection: Azevedo ACCA, Taveira TS, Cristino MAB.
Data analysis and interpretation: Azevedo ACCA, Taveira TS, Barros MVL, Cristino MAB.
Manuscript drafting: Azevedo ACCA, Barros MVL.
Critical revision of the manuscript for important intellectual content: Azevedo ACCA, Barros MVL, Cristino MAB.

Potential Conflicts of Interest

This study has no relevant conflicts of interest.

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Academic Association

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