Ultrasound guided treatment of pseudoaneurysm caused by puncture of the common femoral artery

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KEYWORDS

Pseudoaneurysm;
Angiography;
Color Doppler US.

Abstract Catheter-induced iatrogenic pseudoaneurysm is a complication on the rise as compared to the past. This is due to the increasingly frequent use of percutaneous endovascular intervention in the diagnosis and treatment of several diseases. We present a case which underlines the diagnostic and therapeutic role of color Doppler ultrasound (US) in this pathology.

Sommario La formazione di pseudoaneurismi iatrogeni post-cateterismo è una complicanza in aumento rispetto al passato. Ciò è dovuto a una più ampia e frequente diffusione di trattamenti endovascolari percutanei, sia di natura diagnostica sia interventistica. Viene presentato un caso che sottolinea il ruolo diagnostico e terapeutico dell'eco Color-Doppler in questa patologia.

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Introduction

A pseudoaneurysm is an extravascular cavity which communicates with an artery through a lesion of the vessel wall [1]. Unlike a real aneurysm which is caused by weakening of all three layers of the vessel wall, a pseudoaneurysm can be considered as a perivascular "hematoma" resulting from a lesion affecting the three layers of tunics. In the literature the reported incidence of this pathology is about 1% in diagnostic procedures [2] and 3.5% in treatment procedures [3].

A clinical case

A 71 year-old woman with a clinical history of arterial hypertension and diabetes mellitus type 2 was referred to our department for arterious claudication affecting her left calf after 50 m of walk. Color Doppler ultrasound (US) showed a severe stenosis of the left superficial femoral artery at Hunter's canal with pathological blood flow in the popliteal region. Angiography was therefore performed through the right femoral artery which confirmed the presence of preocclusive stenosis in the superficial femoral artery. A 6F sheath was positioned, and with a right–left crossover percutaneous transluminal angioplasty (PTA) of the stenosis was performed using a 4 × 40 mm balloon (Fig. 1).

Angiographic examination showed a good hemodynamic outcome: no residual stenosis, direct distal perfusion and three-vessel run off. During the procedure heparin therapy

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Fig. 1 Severe stenosis of the left superficial femoral artery at Hunter's canal before and after angioplasty.

(5000 units) was given as well as repeated washings with heparinated physiological solution. When coagulation profile was normal, the sheath was removed and manual hemostasis was performed.

Clinical examination about 2 weeks after discharge revealed the presence of a painful pulsating mass at the level of the arterial pulse in the right inguinal region (the puncture site). Color Doppler US showed a pseudoaneurysm of about 4.5×3 cm communicating with the common femoral artery through a small passage of about 2.5 mm

Fig. 2 Two weeks after angioplasty: a pseudoaneurysm of about 4.5×3 cm communicating with the common femoral artery through a small passage of about 2.5 mm.

Fig. 3 Pseudoaneurysm during compression of the passage; reduced vortical flow within the pseudoaneurysm sack and gradual thrombisation.

(Fig. 2). Color Doppler US guided compression was carried out using a linear 12 MHz probe for about 20 min and then a microconvex 6.5 MHz probe for about 35 min obtaining a gradual exclusion of the pseudoaneurysm sack from the blood circulation through thrombisation and reduction of the vortical flow within the sack until the pseudoaneurysm was completely excluded (Fig. 3). US examination performed 5 days later confirmed this outcome, and after 1 month the volume of the thrombosed sack was reduced and the sack was in the process of being reabsorbed (Fig. 4). Ethical approval for this study was granted by the Medical Research Ethics Committee of our institute, and informed consent was obtained from the patient.

Conclusions

The use of elevated French size sheaths and intravenous infusion of anticoagulating therapy during complicated endovascular procedures, are generally responsible for the increased incidence of pseudoaneurysm. The treatment of choice in pseudoaneurysm is Color-Doppler US guided

Fig. 4 Color Doppler US follow-up 1 month later: the volume of the thrombosed pseudoaneurysm sack is reduced due to lack of arterial blood supply.

compression [4,5]. It is well tolerated by the patients, causes no complications and presents an elevated success rate (63–90%).

Conflict of interest

The authors have no conflict of interest.

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