Spontaneous femoral arterovenous fistula: endovascular treatment

A 72-year-old male patient, with hypertension, dyslipidaemia, COPD, class-II NYHA heart failure, story of alcoholism and ex-smoker underwent a MDCT angiography before popliteal by-pass surgery. The patient was already treated by EVAR for an AAA and right femoro-popliteal bypass (with autologous saphenous vein) for a trombothic popliteal aneurysm.

Imaging Findings:

MDCT-angiography showed early opacification of the right femoral and iliac vein, typical for arterovenous fistula (Fig. 1,2). Reviewing previous radiological examinations this fistula was already reported in a MDCT-angiography before EVAR and femoro-femoral bypass. In relation to important comorbidity and “hostile” anatomy due to previous surgery, an endovascular treatment to occlude this fistula was scheduled. After surgical exposure of the external iliac artery, preliminary angiogram confirmed the high-flow fistula (Fig.3) between deep femoral artery (DFA) and common femoral vein (CFV). With the wire placed in the DFA, a covered stent (Fluency-Bard 10x80mm) was deployed in the proximal DFA, with its proximal markers placed at the origin of DFA. Final check showed the correct placement of the stent-graft and disappearance of the fistula with no residual opacification of the CFV (Fig.4). A CT after 3 months shows regular patency of the covered stent; the high-flow fistula is no longer visible (Fig.5,6-movie).

Discussion:

Femoral fistula, the abnormal communication between femoral artery and corresponding vein, is a rare clinical evidence, often caused by medical procedures (endovascular treatment, vascular surgery, dialysis chateterisation) or secondary to a penetrating trauma [1-8]. Spontaneous fistulas are extremely rare, so rare that just few reports in literature can be found, as can be seen on PubMed library from 2000 until now [5-8]. Usually a fistula can be suspected clinically, by palpation and auscultation, and then confirmed by the imaging, first of all Colour Doppler US. High-flow fistulas can also lead to variable grade congestive heart failure, that represent one of the most important indications for treatment, together with persistent pain, ongoing anticoagulation therapy and the onset of "steal" phenomena with arterial ischaemia of the lower extremity [1, 2, 6]. First therapeutic approach consists in US-guided compression, but it is often not sufficient [1, 2, 5]. Surgery remains the therapy of choice in many patients, above all...
by the ligation of the fistula [7, 8]. Sometimes the fistular tract cannot be found, or the arterialised vein can lead to haemorrhage for venous hypertension during surgery, or it can develop an infection in the surgical site. Additionally previous surgical procedures can make the site of the fistula extremely hostile for further surgery [3, 5]. For these reasons the endovascular treatment can be a good alternative, firstly by stenting [1-4]. Balloon expandable stents provide for an optimal placing, while self-expanding stents are more flexible and resist better to extrinsic compression. In complex fistulas a combined approach with embolisation can be taken into consideration [5, 6], for example when there is more than just one communication between artery and vein, or when the stent moves from its original position, or in case of deformation and kinking of the stent with persistence of arterovenous shunt. However, even embolisation can have complications, first of all distal embolisation with possible peripheral ischaemia. The choice of the shortest stent possible is important to avoid both the above mentioned complications and the risk of involuntary closure of the side branches of the artery [2, 3]. In addition, double antiaggregating medication (clopidogrel and acetylsalicylic acid) should be considered to maintain graft patency in patients with high risk of stent occlusion [3, 9].

**Differential Diagnosis List:** Femoral arterovenous fistula, Femoral artery aneurysm, Femoral vein aneurysm

**Final Diagnosis:** Femoral arterovenous fistula

**References:**


Description: Axial image: dilated aspect of both common iliac arteries in a patient previously treated for an AAA with a bifurcated stent-graft. Mild enhancement of the right iliac vein. **Origin:** Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy

Description: Axial image (lower level): diffuse ectasia of iliac arteries and simultaneous opacification of right iliac veins. **Origin:** Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
Description: Lower axial image: same findings. **Origin**: Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy

Description: Scan at the level of common femoral arteries with simultaneous opacification of right common femoral vein. **Origin**: Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
Description: Volume Rendering elaboration clearly shows filling of the femoral and iliac vein on the right side in a typical aspect of arterovenous fistula. **Origin:** Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
Description: 3D volume rendering after stenting: good visibility of the covered stent-graft in the deep femoral artery and disappearance of the AV fistula. Origin: Strutt. Compl. di Radiologia, Az. Osp-Univ. Trieste, Italy
Description: 3D Volume Rendering: the "new" anatomy

Origin: Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
Description: 3D Volume Rendering elaboration shows the communication between artery and vein (arrow). Origin: Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
Description: 3D Volume Rendering elaboration shows the communication between artery and vein (arrow and orthogonal planes). Origin: Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy
**Description:** Preliminary angiography (early and later frames) clearly shows the high-flow fistula from the profunda femoralis artery to the dilated common femoral vein. **Origin:** Strutt. Compl. di Radiologia, Az Osp-Univ. Trieste, Italy.
Figure 5

Description: Angiography after stent-graft deployment (arrows on radio-opaque markers) shows complete disappearance of the AV fistula. Origin: Strutt. Compl. di Radiologia, Az. Osp-Univ. Trieste, Italy
Description: Axial scan shows regular patency of the stent-graft in the right deep femoral artery and absent opacification of the femoral vein. Origin: Strutt. Compl. di Radiologia, Az. Osp-Univ. Trieste, Italy