

Received: 2010.12.06  
Accepted: 2012.04.04

## Use of expanded polytetrafluoroethylen (ePTFE) stent graft in autogenic AV fistula with false aneurysm in lower extremity

Dominik Sieron<sup>1</sup>, Philipp Wiggermann<sup>2</sup>, Daniel Knap<sup>3</sup>, Wojciech Wawrzynek<sup>1</sup>, Christian Stroszczyński<sup>2</sup>

<sup>1</sup> Department of Radiology, District Hospital of Orthopaedics and Trauma Surgery, Piekary Śląskie, Poland

<sup>2</sup> Department of Radiology, University Hospital Carl Gustav Carus, Dresden, Germany

<sup>3</sup> Department of Radiology, Interventional Radiology and Nuclear Medicine, Medical University of Silesia, Katowice, Poland

Author's address: Dominik Sieron, Szronowa 4 St., 40-316 Katowice, Poland, e-mail: dominik.sieron@gmail.com

### Summary

A 28-year-old German-Caucasian man arrived with deep vein thrombosis DVT, pain, oedema and rubor of right lower limb and drug abuse. The US Doppler imaging showed an autogenic AV fistula and false aneurysm of the right superficial femoral artery and femoral vein. The CT imaging showed additional closing of the left external iliac artery and common femoral artery, and of the distal and middle parts of the superficial femoral artery. The patient was treated within the angiography suite using a 8/25 mm (8 mm diameter/25 mm length) peripheral graft with expanded polytetrafluoroethylen ePTFE stent. After stent deployment, the dilatation was performed using 8/20 mm (8 mm diameter/20 mm length) balloons. After intervention, the digital subtraction angiography showed a good stent position with complete exclusion of false aneurysm and AV fistula. The outcome of US Doppler imaging also confirmed successful intervention.

**Key words:** autogenic AV fistula • expanded polytetrafluoroethylen ePTFE stent graft • CT contrast

**PDF file:** <http://www.polradiol.com/fulltxt.php?ICID=882969>

### Background

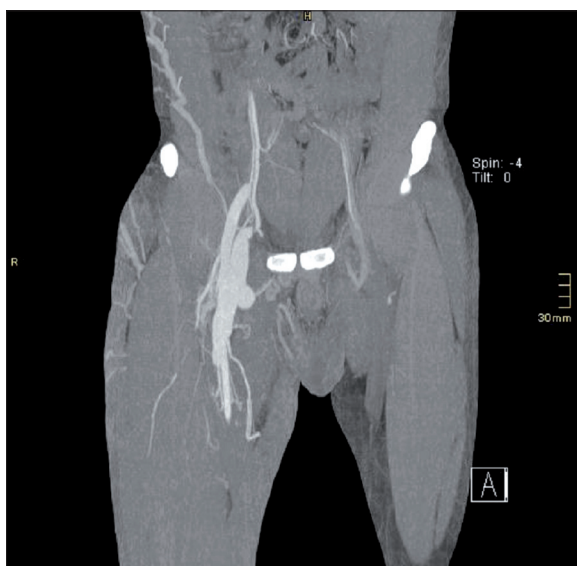
Arterovenous fistulas in the area of femoral vessels are rare and most commonly of iatrogenic or posttraumatic origin [1]. Such lesions are usually located near aortic bifurcation or femoral arteries because of frequent surgical and/or orthopedic interventions [2,3] in this region. In DSA imaging (especially in posttraumatic patients), AV fistula often coexists with artery dissection or a pseudoaneurysm [1].

### Material and Methods

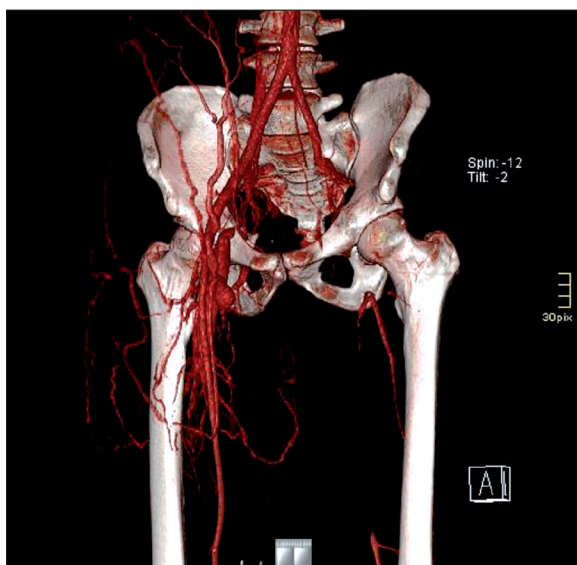
A 28-year-old Caucasian patient presented with deep vein thrombosis (DVT), pain, edema of the right lower limb and HCV. Doppler ultrasound examination and contrast-enhanced computed tomography revealed an AV fistula between the right superficial femoral artery (SFA) and femoral vein (FV) as well as a pseudoaneurysm (Figure 1). Imaging also demonstrated: closing of external inguinal artery (EIA), common femoral artery (CFA) and superficial



**Figure 1.** Pseudoaneurysm emerging from the superficial femoral artery (SFA).



**Figure 2.** Arteriovenous fistula with a pseudoaneurysm emerging from the superficial femoral artery.

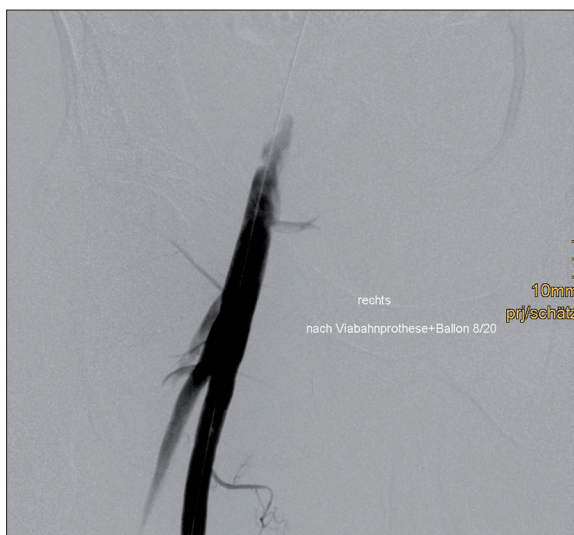


**Figure 3.** Reconstruction in 3D shows the exact location of the vascular malformation as well as closing of the left external iliac artery (EIA), common femoral artery (CFA) and superficial femoral artery with the re-entry phenomenon observed in its distal part.

femoral artery with contrast re-entry observed in the distal part of SFA (Figures 2, 3). The patient was referred to the angiography suite for expanded-polytetrafluoroethylene-covered (ePTFE) stent graft implantation. Due to the location of the fistula in the proximal part of the superficial femoral artery and closing of the external iliac artery, an ultrasound-guided puncture of the middle SFA segment was performed and a 4F sheath was introduced. A diagnostic catheter was entered and diagnostic angiography was carried out in order to verify the choice of the preferred stent graft and to assess the area of implantation. After widening of the entry site, we introduced a 9F sheath, administered 5000 IU of heparin and implanted a peripheral artery 8/25 mm stent graft (8 mm in diameter and 25 mm in length).



**Figure 4.** Status post stent graft implantation. DSA picture shows a leak in the area of the neck of a pseudoaneurysm.



**Figure 5.** Status post implantation and balloon dilatation of a stent graft. DSA image demonstrates proper contrast flow in the SFA and leak closure.

We performed control angiography, which revealed a small leak in the pseudoaneurysm area (Figure 4). We used a 8/20 mm balloon (8 mm in diameter and 20 mm in length) for leak closure. Control DSA following balloon stent graft dilatation showed good SFA perfusion and no leak (Figure 5). Due to a large diameter of the sheath and high risk of complications [4], closing of the site of puncture and sheath insertion was performed in the operation room.

After the procedure, the patient underwent Doppler ultrasound imaging, which corresponded to the DSA result and confirmed good outcome.

## Results

Endovascular treatment of lower limb AV fistulas using expanded-polytetrafluoroethylene-covered (ePTFE) stent graft is a method of choice over surgical as well as

conservative management, which involves AV fistula compression under Doppler ultrasound guidance [5]. It is an

alternative to surgical intervention, which requires long convalescence time, for young or high-risk patients.

---

## References:

1. Stewart DK, Brown PM, Tinsley EA Jr et al: Use of Stent Grafts in Lower Extremity Trauma. *Ann Vasc Surg*, 2011; 25(2): 264.e9-13
2. Düz B, Kaplan M, Günay C et al: Iliocaval arteriovenous fistula following lumbar disc surgery: endovascular treatment with a Stent-graft. *Türk Neurosurg*, 2008; 18(3): 245-48
3. Schepers S, Fourneau I, Daenens K et al: Endovascular treatment of an ilio caval arteriovenous fistula presenting with multiple organ failure. *Surg Laparosc Endosc Percutan Tech*, 2009; 19(6): e244-46
4. Sulzbach-Hoke LM, Ratcliffe SJ, Kimmel SE et al: Predictors of complications following sheath removal with percutaneous coronary intervention *J Cardiovasc Nurs*, 2010; 25(3): E1-8
5. Dean SM, Olin JW, Piedmonte M et al: Ultrasound-guided compression closure of postcatheterization pseudoaneurysms during concurrent anticoagulation: a review of seventy-seven patients. *J Vasc Surg*, 1996; 23: 28-34