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## Case Report

# A Bail Out Solution for an Urgent Situation: Endovascular Exclusion and Embolization of an Infected Femoral Pseudoaneurysm

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**Purpose:** The aim of this study is to show the utility of the combination of thrombin and endograft to solve an urgent situation related to femoral infections.

**Case:** We present the case of a 91-year-old female patient who underwent a femoral endarterectomy and superficial femoral artery angioplasty and developed a surgical site infection. She was readmitted to the hospital because of bleeding and was operated to suture the femoral patch and to do a plasty of sartorius muscle. Six days after the last intervention a femoral pulsatile mass was noted, and the computed tomography showed a big femoral pseudoaneurysm. Taken again to the theater and via a contralateral puncture a viabahn covered endograft was deployed from the external iliac artery to the yet diseased but patent femoral superficial femoral artery and the pseudoaneurysm was punctured, emptied, and filled with thrombin. The patient was discharged 2 weeks after the last procedure and lived for 10 months (she died because of a nonvascular related cause) with a patent graft and with healed lesions.

**Conclusions:** In this case the endovascular solution was a definitive solution in a very old patient with several comorbidities.

Infection of vascular grafts is one of the most feared complication in vascular surgery, because of the high early mortality and the worsening of the late patient prognosis.<sup>1</sup> Although the main indication is the complete removal of the infected material, it

is not always possible and the main indication for treatment is to avoid future complications, such as a sudden blowout of the artery.<sup>2</sup> We present a case of a very old female patient who was candidate for conservative treatment.

A 91-year-old female patient was referred to our clinic because of rest pain and ischemic lesions in her right foot. She suffered from dyslipidemia, hypertension, and diverticulitis. Femoral weak pulses were present without distal or popliteal pulses palpable. Right ankle-brachial index (ABI) was 0.21 and left ABI was 0.57. An angioCT (computed tomography) was performed (Fig. 1) showing a patent right iliac artery, a very tight and calcified stenosis in the common femoral artery, and multiple severe lesions (Trans-Atlantic Inter-Society Consensus) in the superficial femoral artery (SFA). Due to her critical limb ischemia a hybrid approach was planned. An open right femoral endarterectomy (bifurcated pericardial patch closure) and an endovascular recanalization of the SFA (drug

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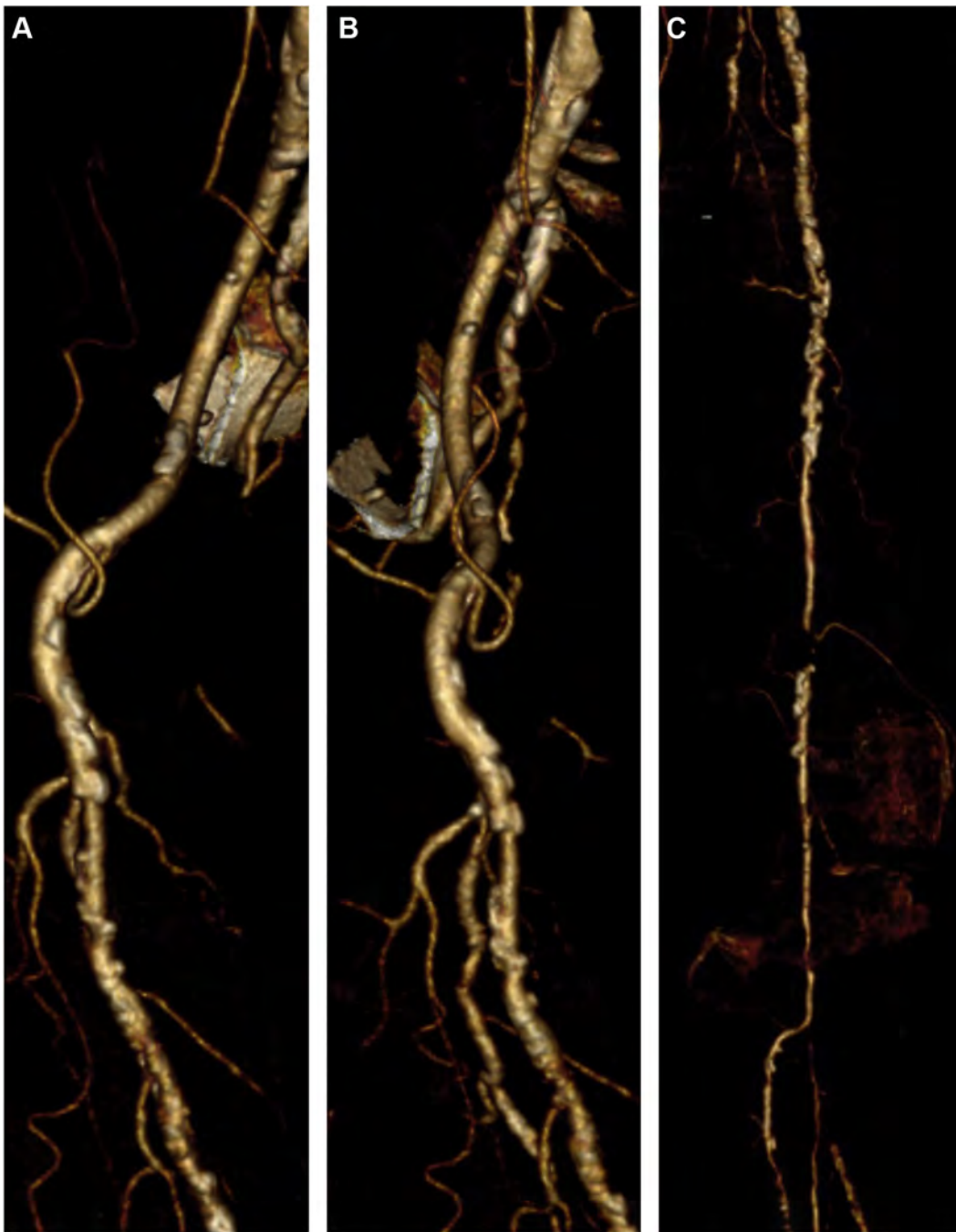
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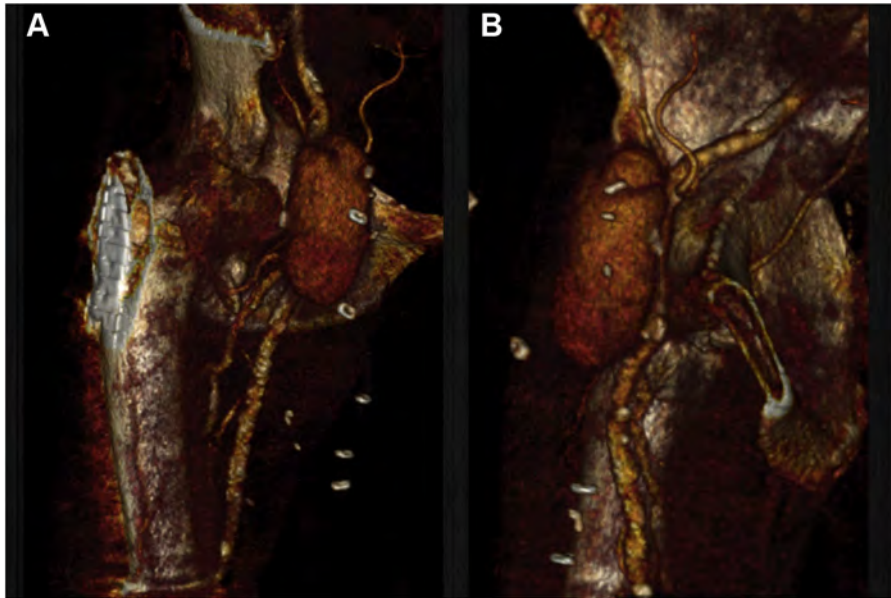


**Fig. 1.** Diagnostic CT showing a patent common and external iliac artery with a diseased common femoral artery (**A**, **B**) and a short obstruction of the mid-SFA (**C**).

eluting balloon angioplasty) were performed with a good immediate result and relief of the ischemic rest pain.

After surgery she presented fever with positive blood cultures to *Pseudomonas aeruginosa*. She was treated with intravenous antibiotic therapy for 2 weeks and 4 weeks oral. The groin wound closed

without issues and the patient was discharged 3 weeks after the initial surgery. Three days after discharge the patient was referred again to the emergency room because of groin bleeding. She was taken urgently to the operating room and the wound was opened and cleaned, without seeing any site of bleeding. To avoid ligating the artery



**Fig. 2.** Second CT performed showing a big pseudoaneurysm of the previous femoral patch (A and B).



**Fig. 3.** Intraoperative images. Diagnostic angiography (A). Contrast injection through the 4F sheath introduced directly in the pseudoaneurysm previous to the thrombin

injection (B). Patent Viabahn and distal SFA (C, D) and final result after ballooning the distal end, showing a patent graft and no filling of the pseudoaneurysm (E).



**Fig. 4.** Groin closed wound without signs of infection 8 months after the last procedure.

due to the age of the patient, the suture was reinforced, the wound was cleaned with antibiotics, and a plasty with sartorius muscle was done.

The patient did well initially, with a decrease in the inflammatory markers (C-reactive protein and white blood cell count), but with a superficial dehiscence of the wound. Fifteen days after the last surgery with intravenous antibiotic therapy a growing palpable pulsatile mass was noted in the groin. The urgent angioCT done (Fig. 2) showed a big pseudoaneurysm due to a complete dehiscence of the patch. Due to the patent SFA we decided to exclude the pseudoaneurysm with an endograft (Fig. 3).

Through an ultrasound-guided puncture of the left common femoral artery a 7 × 150 mm Viabahn (Gore, Flagstaff, AZ) was deployed from the right external iliac artery to the SFA, excluding the origin of the profunda (as it was a bifurcated patch there was no distal neck to land the graft) and the distal end was dilated with a 6-mm balloon. Once direct flow to the pseudoaneurysm was blocked, it was punctured and a 4F sheath inserted to drain 50 cc of blood. To favor the formation of clot, 10 cc of TISSEEL (Baxter, Deerfield, IL) was introduced inside the cavity (to prevent the growth of the

pseudoaneurysm due to the profunda back-bleeding). The patient recovered uneventful from this last surgery and was kept on antibiotics for 6 weeks more (levofloxacin 500 mg once daily and rifampicin 600 mg once daily). She was discharged 2 weeks after the last surgery and followed up in our outpatient. She died 10 months after the last surgery, with a patent endograft, no rest pain, and closed wounds (Fig. 4).

Arterial infections are a very aggressive complication of revascularizations and classically an aggressive approach has been recommended.<sup>3</sup> Endovascular exclusion of the bleeding area has been described,<sup>4–6</sup> especially in patients not fit for such a risky surgery or as a bridge therapy until definitive surgery. In the infection of material (graft or patch) in the groin several options have been described, such as obturator canal bypass,<sup>7</sup> femoro-femoral bypass,<sup>8</sup> or transperineal bypass<sup>9</sup> or even ligation.

In this case we managed 2 options due to the age and comorbidities of the patient: endovascular exclusion versus open ligation of the common, superficial, and profunda femoral arteries. As the first attempt with an endovascular approach did not exclude the second option, a minimal invasive treatment was tried, together with the infusion of thrombin. Thrombin injection has been described and is widely used to treat post-function arterial pseudoaneurysms,<sup>10,11</sup> but not to treat infectious pseudoaneurysms. In our case it allowed to prevent the back-bleeding of the profunda as a safe way to promote the clot formation inside the pseudoaneurysm.

Although it is obviously not the preferred approach to exclude the profunda ostium, this option may be valid for certain patients, nowadays that we treat older and complicated patients, who cannot always face an aggressive surgery.

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