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SHORT REPORT

Mycotic pseudo-Aneurysm Occurring 22 Months after Popliteal Artery Stenting

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*A case of mycotic pseudo-aneurysm (*Staphylococcus aureus*), occurring 22 months after a popliteal artery stenting with a Palmaz endoprosthesis in a 46-year-old diabetic Fontaine stage IV patient, is reported. This rare late infection after an arterial stent implantation and antimicrobial preventive therapy are discussed.*

Key Words: Stent, complications; Diabetes mellitus; Infection; Popliteal artery.

Introduction

Infections of implanted vascular stents are rare[1–12]. In the majority of cases, the infection causes symptoms within the first month after stent implantation. We report a case of late infection in a 46-year-old diabetic Fontaine stage IV patient in whom a mycotic pseudo-aneurysm (*Staphylococcus aureus*) ruptured 22 months after the popliteal artery was stented with a Palmaz endoprosthesis.

Case Report

A 46-year-old man was admitted to hospital because of necrosis of the distal part of the right second toe. The clinical history showed that he had been a heavy smoker (20 pack-years) but had stopped for 5 years, he had had type1 diabetes mellitus since the age of 26, considered at this time as well-controlled, hypertension treated with triple drug therapy, renal failure (creatinine 224 μmol/ml) and intermittent claudication of the right lower limb at 200 m. No pulses could be felt below the femorals. The arteriogram showed no aortoiliac disease, but there was an occlusion at the origin of the right popliteal artery (Fig. 1). The anterior tibial artery reconstituted above its distal third which was occluded. The tibioperoneal trunk was tightly stenosed in its lower third. It bifurcated into a peroneal artery, which was thrombosed 2 cm beyond its origin, and a patent posterior tibial artery with a severe proximal stenosis.

Intravenous antibiotic therapy (Oxacillin 3 g/24 h, Metronidazole 1.5 g/24 h), vasodilatators (Buflomedyl 400 mg/24 h) and Heparin (1500 IU × 12/24 h) was started immediately because of the local infection. A week later, as there were no clinical or biological inflammatory symptoms, a percutaneous recanalization of the right popliteal artery was attempted via an antegrade common femoral puncture, using a hydrophilic guide-wire (Terumo Corporation, Tokyo, Japan) followed by a 5 mm dilatation balloon, but the result was incomplete (Fig. 2). Then, using a balloon of 3 mm in diameter, the tibioperoneal stenosis was dilated. Finally, a 3-cm-long Palmaz stent (Cordis Europa, Roden, The Netherlands) mounted on a 5 mm × 4 cm balloon was expanded to complete the treatment of the femoro-popliteal occlusion. The whole procedure took 30 min (Fig. 3).

Heparin anticoagulation was continued for 3 days after the procedure and the same antibiotics were administered for 2 weeks. One month later, necrosis of the third right toe appeared. The angiogram revealed a patent stent but restenosis of the tibioperoneal trunk. A transmetatarsal amputation of the right foot was performed. The same antibiotics were administered for 3 weeks. The immediate follow-up was complicated by deterioration in diabetic control and worsening renal failure (creatinine 400 μmol/ml),

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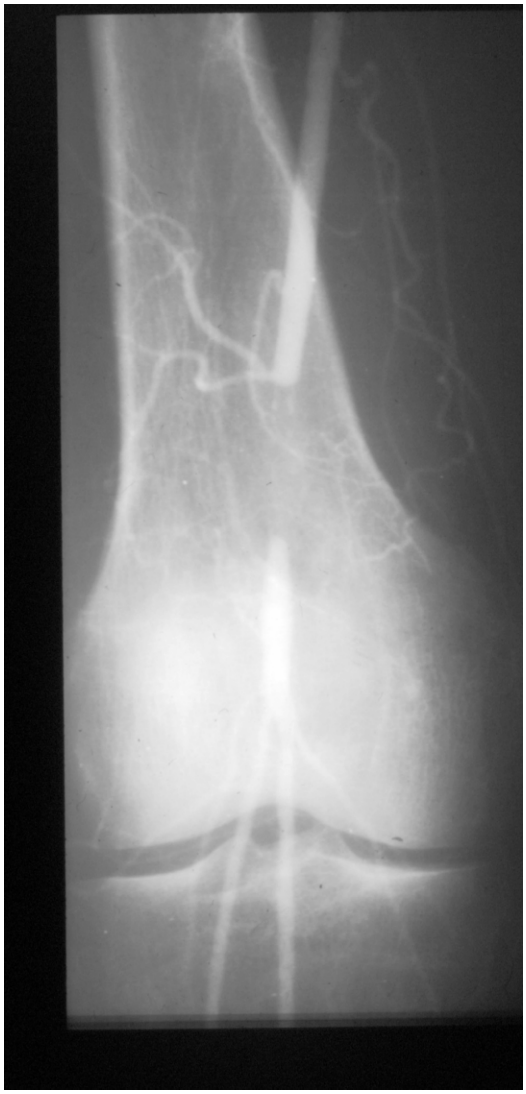

Fig. 1. Initial angiogram: occlusion of the upper segment of the right popliteal artery.

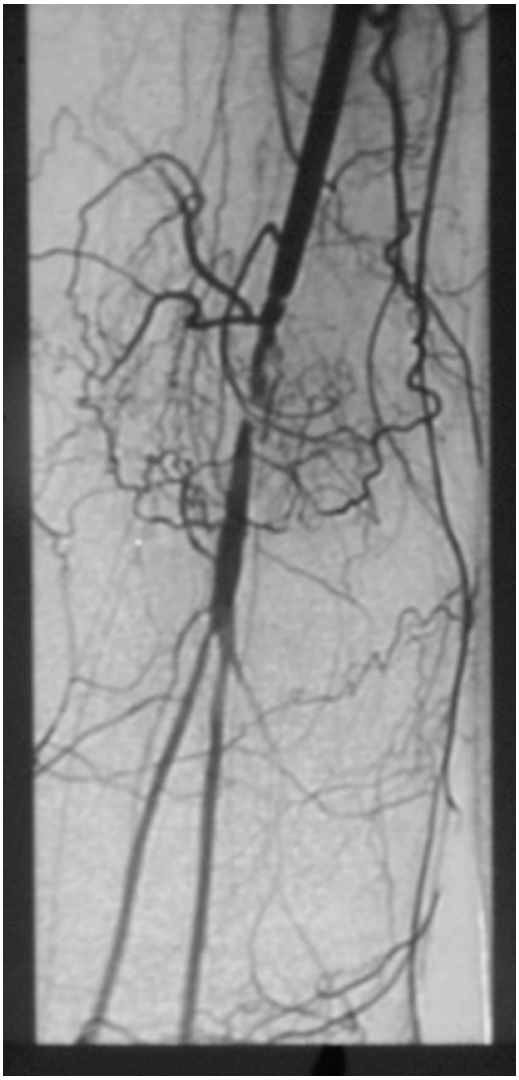

Fig. 2. Incomplete result after mechanical recanalization (using guide-wire and balloon PTA).

but these had recovered within 4 weeks by which time the amputation wound had healed.

Eighteen months later, purulent fluid began to discharge from the amputation scar, and the patient was readmitted to hospital as he had a fever higher than 40 °C, a leucocytosis (17,000/mm^3), renal failure (creatinine clearance 35 ml/min) and a deep venous thrombosis of the right leg with an extension into the superficial femoral vein which was diagnosed on duplex scanning.. Blood cultures revealed a methicillin resistant staphylococcus aureus (MRSA) which was treated according to culture results (heparin, fucidic acid 500 mg × 6/24 h, teicoplanin 200 mg/24 h). Four days later, the patient developed acute septic arthritis of the right knee and 40 ml of sterilepus was removed by needle aspiration. There was no evidence of endocarditis on echocardiogram. Four weeks later, he presented with pain in the right thigh which was associated with an expansile mass in the right popliteal fossa. A CT scan and an arteriogram (Fig. 4) showed a pseudo-aneurysm of an occluded popliteal artery at the level of the stent. At operation a ruptured mycotic pseudo-aneurysm was confirmed and the superficial femoral artery was tied above the stent. The stent was removed and a drain was left in place.

Microscopic examination of the stent confirmed the presence of leucocytes, and staphylococci in clusters. The wound healed and the patient was able to walk within a claudication distance of 200 m. At followup at one year, the claudication distance was unchanged but the renal failure had worsened and the patient was on dialysis.

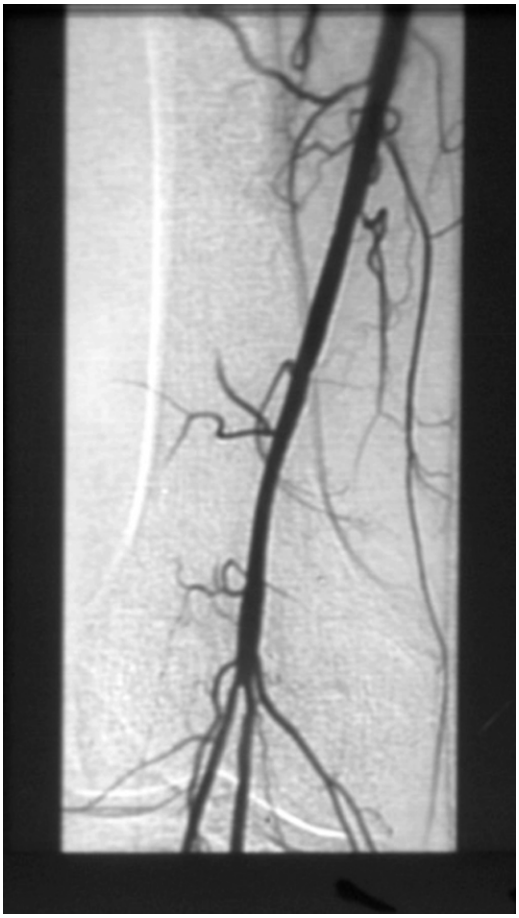

Fig. 3. Immediate control after stenting.

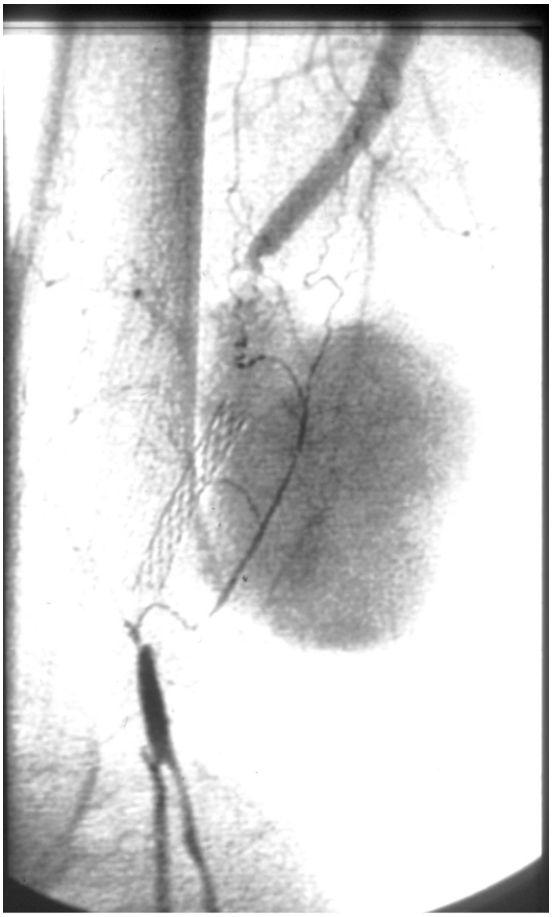

Fig. 4. Large false aneurysm above the occluded stent.

Discussion

There is not much evidence for the use of stents in the popliteal artery, and the presence of distal infection in this patient might have mitigated against the use of one. The arterial occlusion in this young patient was short and we preferred to attempt endovascular recanalization rather than a surgical bypass. As the angiographic result after a simple balloon PTA was poor, a stent was used.

Although bacteriemia has been reported in 4–8% of interventional vascular radiological procedures[1,2] septic complications are rare. Skin and line infection are the most commonly cited.[1] It is very rare for the arterial site of a stent implantation to get infected: most of these occur early (between 2 and 21 days after the procedure),[3–9,11–14] and are probably due to seeding from peri-procedural bacteriema, usually associated with bacterial adherence to the thrombin/platelet layer on the stent.[13,16,17] The infection agent is usually staphylococcus aureus.[3–9,11,12,16] According to other authors,[5,7–9,11,18] we believe that a real role exists for prophylactic antibiotics, intra and post procedural heparinization and/or antiplatelet agents.

Only two late septic arterial complications have been described.[10,18] The first one occurred 4 months after the implantation of an iliac artery stent and resulted in a false mycotic aneurysm; an abdominal boil was responsible for a staphylococcus aureus bacteriema which resulted in stent infection.[10] The second report concerns a false aneurysm infected by staphylococcus aureus 22 months after an iliac artery stent was placed.[18] The authors concluded that systemic antibiotic prophylaxis should be used at the time of stent insertion. Secondary complications usually follow bacteriemic episodes and come from a source unrelated to the stenting procedure.[5,18]

Experimental results show that a stent infection may occur following a bacterial challenge up to 4 weeks after implantation.[15,16] Secondary infection is less likely with the passage of time because of the protective effect of a stable neoimtimal coating. Delayed manifestation of primary infection due to a low virulence organism such as the coagulase negative

staphylococcus. may be an additional cause besides the simply classified primary and secondary infections.

To our knowledge, this was the first case of mycotic popliteal artery rupture after a stent implantation; it happened as a consequence of a hematogenous infection by staphylococcus aureus. We think that the infection was probably secondary to the local infection of the surgical amputation wound. We did not observe any hematoma at the groin puncture site, and when the stenting was carried out, oxacillin and metronidazole had been administered for a week previously. In the interval between implantation and infection, the patient did not have any infective episode other than the infection of the amputation site.

Our case also confirms that an arterial stent infection cannot be treated just with antibiotics but requires early surgical removal. We finally think that whenever a staphylococcus infection is possible (boil, abscess, wound, etc.) stenting must be carefully considered; and when it cannot be avoided, antistaphylococcus prophylactic antibiotics are required to try to prevent an hematogenic stent infection from happening, especially for diabetic and immunocompromised patients. Too short a course of antibiotic treatment may have been responsible for the late complications in our case.

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