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Case Report

Surgical Management of an Infected Popliteal Artery Aneurysm

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Infective aneurysms are rare due to the antimicrobial advances and the early treatment of systemic infections. They represent a diagnostic and therapeutic challenge. The treatment for these cases is generally characterised by excision and reconstruction using an autologous vein graft. We describe a case of a 66-year-old man who presented an 8 cm infected popliteal aneurysm where urgent surgical approach was performed. The vascular continuity was restored with a basilic vein. Clinical follow-up showed no signs of recurrent infection and patent bypass without any anastomotic pseudoaneurysm after a year.

Key Words: Aneurysm, Infected, Popliteal artery

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INTRODUCTION

Mycotic or infective aneurysms involving popliteal arteries are a rare condition and represent a diagnostic and therapeutic challenge. There is a huge variation in the anatomic location, clinical presentation, causative organism and the age at presentation for these patients [1]. Treatment is generally characterised by excision and reconstruction using an autologous vein graft [2-4].

We present a case of a 66-year-old man who presented an infected popliteal artery aneurysm; we describe the clinical presentation, radiological investigation, histologic examination and the surgical management.

CASE

A 66-year-old man with a smoking history, dyslipidemia, and a coronary bypass surgery procedure done 7 months before came to the emergency hospital with fever and cellulitis in the left popliteal fossa.

A clinical examination revealed a pyrexic patient with a painless, pulsatile swelling of the left popliteal fossa with

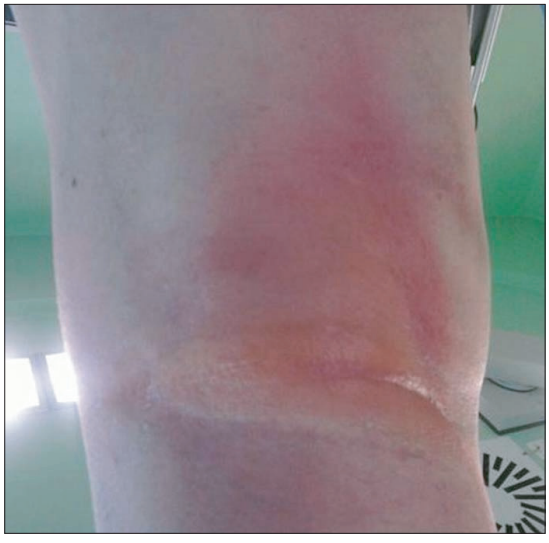

Fig. 1. Cellulitis and pulsatile mass at the left popliteal fossa.

signs of local inflammation (Fig. 1), and distal pulses were present. His contralateral leg had intact femoral, popliteal (expansive) and distal pedal pulses.

The blood tests showed a significantly raised white blood cell count of 17.30×10^9/L. The blood cultures initially were negative.

Duplex scan showed a large popliteal aneurysm of 8.0×7.2 cm with gas inside the popliteal sac (Fig. 2), without deep vein thrombosis. A 3.1 cm popliteal artery aneurysm was noted on the right side and both great saphenous veins were not apt for bypass.

An urgent computed tomography (CT) angiogram showed a large fusiform aneurysm of the left popliteal artery of approximately 8×7 cm with gas inside the aneurysmal sac, without contrast extravasation. There was a contralateral popliteal aneurysm of approximately 3 cm. (Fig. 3).

Surgery was performed through a standard medial approach. After proximal and distal control of the popliteal artery the aneurysm was excluded with ligation of the popliteal artery. Vascular continuity was restored with a basilic vein graft of the left arm from the first popliteal portion to the distal third portion (Fig. 4). The aneurysm was opened and decompressed through a posterior approach. There was organized thrombus with evidence of purulence, thus multiple cultures were sent, including tissue from the aneurysm sac. We decided closure of the posterior approach by secondary intention. After the operation, distal pulses were present.

Histologic examination revealed bacterial colonies and polymorphonuclear inflammatory infiltrates (Fig. 5); cultures of the operative specimens were positive for *Staphylococcus aureus*. The result of an echocardiogram was normal and no other focus of sepsis was found.

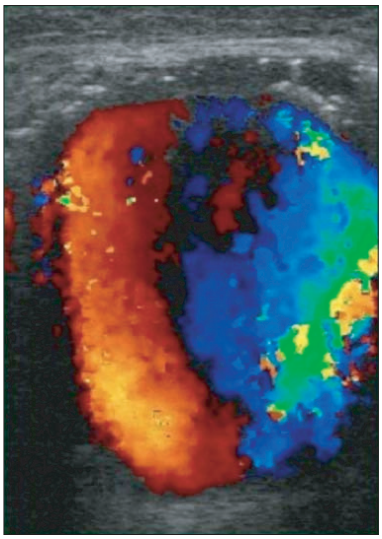

Fig. 2. Duplex scan of the infected popliteal aneurysm.

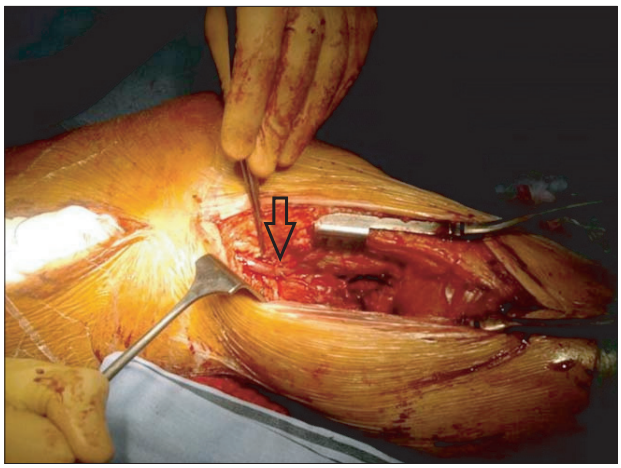

Fig. 4. Popliteal-popliteal bypass with basilic vein (arrow).

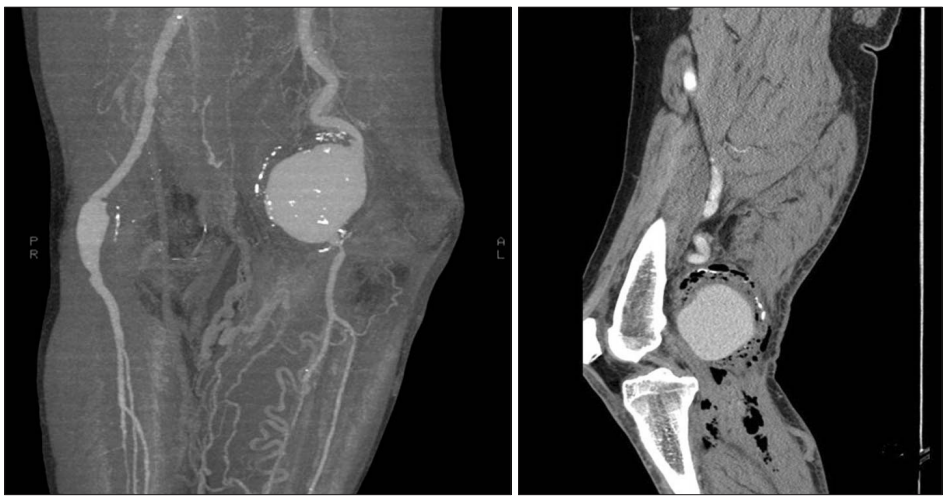

Fig. 3. Computed tomography angiogram.

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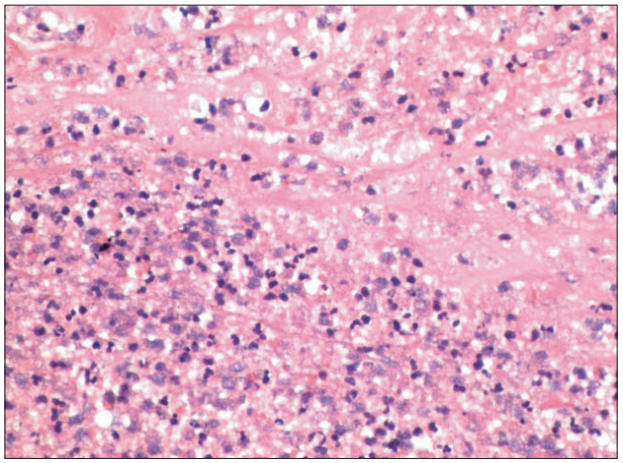

Fig. 5. Thrombotic material and vascular wall with inflammatory infiltrate polymorphonuclear and remains of bacterial colonies, compatible with mycotic aneurysm (H&E stain, x200).

He received antibiotic therapy with vancomycin and metronidazole for a month.

The patient was discharged home on the 22nd postoperative day, with oral antibiotic (dicloxacillin) for one month and antiplatelet therapy with aspirin.

One month after discontinuing the antibiotics, the patient returned with recurrence of cellulitis in the left popliteal fossa. A repeat duplex scan showed a patent bypass with a nonresolving hematoma of 10×4 cm without gas. The hematoma was evacuated through a posterior approach, without evidence of purulence. The patient was discharged home on the 7th postoperative day with oral antibiotic for one month.

The patient recovered well, with healed posterior surgical wound. Clinical follow-up showed no signs of recurrent infection and patent bypass after a year.

DISCUSSION

Peripheral mycotic aneurysms are rare and only described as case reports. The pathogenesis of mycotic aneurysms includes 4 different mechanisms: 1) contiguous septic processes extending to the periarterial lymphatic vessels and the vasa vasorum of nearby arteries, 2) bacterial infection of an intimal injury or an atherosclerotic plaque during bacteremia, 3) direct bacterial inoculation at the time of arterial trauma and 4) septic embolization to the vasa vasorum [5]. The classical description of mycotic aneurysms is "infected aneurysms developing in a previously normal artery secondary to septic embolization due to bacterial endocarditis" [6]. In the postantibiotic era, the causative organisms of mycotic aneurysms are most commonly Staphylococcus aureus, Salmonella species, and less commonly viridans group streptococci. Recent reports suggest Streptococcus pneumoniae, including penicillin-resistant strains, are re-emerging as a cause of mycotic aneurysms [7].

In our patient the result of an echocardiogram was normal and we could not find any other focus of infection, thus we believe that the coronary artery bypass surgery he had seven months prior to his visit to the emergency room could have presented as a bacteremia that colonized in the left popliteal aneurysm and contributed to its large size and his clinical presentation. During his stay in the reanimation unit after coronary bypass he had a significantly raised white blood cell count of 14.00×10^9/L without associated fever (37°C) or focus of infection, and he received intravenous antibiotic therapy with levofloxacin. The patient denied any history of trauma or injury of the leg.

Mycotic or infected popliteal aneurysm presents as a painful, pulsatile leg swelling in pyrexic patients with a definitive or unsuspected infective focus [8]. Laboratory studies are unhelpful in diagnosing mycotic popliteal aneurysms; systematic inflammatory response is common. Although inflammatory markers are usually raised, cultures are only positive in 50% of the cases [1]. The diagnosis of infected aneurysm can be established by CT, colour duplex ultrasonography and magnetic resonance imaging [9].

The management of mycotic aneurysms is well established. Extra-anatomic revascularization is recommended, followed by resection of the aneurysm and debridement of infected tissue [10]. Endovascular approaches have been reported with favourable outcome [11-13].

Infected popliteal artery aneurysms are uncommon with a high risk of rupture and limb amputation. The gold standard management is surgical intervention with excision and reconstruction using an autologous vein graft, preferably with the great saphenous vein. Superficial veins of the arm can be used as in our case, where we used the basilic vein. A prolonged antibiotic therapy is mandatory. An endovascular approach should only be used in selected cases.

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