Case Report

Popliteal Artery Aneurysms Masquerading as Deep Vein Thrombosis

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INTRODUCTION

Popliteal aneurysms are infrequent but nevertheless the most common of all peripheral aneurysms[3]. Complications arising from popliteal artery aneurysms may result in an acutely swollen or painful leg. The correct diagnosis is frequently missed while deep venous thrombosis is being excluded. This delay may be exacerbated if patients present initially to non-vascular specialities. Early surgical intervention has been shown to have a favourable outcome in popliteal artery aneurysm with lower rates of limb loss[1,2,3,4,5,6,7].

The association between popliteal artery aneurysm and deep vein thrombosis (DVT) has mostly been reported sporadically. Reports include cases resulting from compression of the popliteal vein from otherwise uncomplicated popliteal aneurysms[8] and complicated cases involving ruptured atherosclerotic[9], false[10] and mycotic[11] popliteal aneurysms. Downing published an excellent report of the presentation of popliteal artery aneurysm, including the erroneous diagnosis of venous thrombosis, and the potential for delay in treatment[12]. Recently, this was vividly brought to mind by a series of patients presenting to our unit with severe complications arising from popliteal artery aneurysms, in each case with a dubious initial diagnosis. We would like to report three patients each presenting with a swollen or painful leg, each with different acute aneurysmal pathologies of the popliteal artery, where an erroneous initial diagnosis of deep vein thrombosis may have lead to a delay in treatment.

CASE REPORTS

Case 1

A 77 year old man with known ischaemic heart disease and paroxysmal atrial fibrillation treated with aspirin and amiodarone, presented with progressive painful swelling of his left leg. He was also known to have a 5cm abdominal aortic aneurysm, which was under surveillance. On examination, he was tachycardic and pyrexial with a tender, swollen, erythematous left leg. A deep venous thrombosis with overlying cellulitis was diagnosed and he was commenced on intra-venous antibiotics and therapeutic doses of subcutaneous Heparin.

Blood cultures grew salmonella enteriditis phage type 4 sensitive to ciprofloxacillin, which was commenced. Subsequent CT scan confirmed a large false aneurysm of the popliteal artery with surrounding soft tissue suppuration and oedema (Fig. 1). These findings were suggestive of ruptured popliteal artery, secondary to a salmonellosis-induced mycotic aneurysm rather than deep venous thrombosis. He was taken to theatre, and a reversed long saphenous vein femoro-popliteal bypass graft was performed with the graft tunnelled subcutaneously through uninfected tissue. The intervening popliteal artery with its mycotic portion was ligated proximal and distal to the area of sepsis. Necrotic tissue in the muscle compartments of the thigh and popliteal fossa was debrided and the wound left open. Salmonella was cultured from pus specimens obtained intra-operatively.

The patient made a slow recovery on the intensive care unit and was discharged back to the ward on the tenth postoperative day with a clean healing wound and a functioning bypass graft.

Case 2

A 53 year old man presented to his General Practitioner with a five-day history of increasing pain in his left leg, difficulty walking, and a cold, numb foot. He was a smoker of 15 cigarettes per day and was on perindopril for hypertension. A deep vein thrombosis was suspected and a routine venogram was booked by the general practitioner. However as his symptoms were deteriorating, the venogram was performed urgently (Figure 2A). He was admitted to the surgical ward directly following the venogram with a cold, pulseless and mottled left foot. A large popliteal aneurysm was easily palpable, and confirmed by duplex scan.

An urgent intra-arterial digital subtraction angiogram was arranged. This showed a patent popliteal artery aneurysm with extensive distal embolisation (Figure 2B and 2C). Catheter directed thrombolysis was initiated and after 18 hours there was a good clinical improvement. A check angiogram showed an improvement in the patency of the calf vessels and arrangements were made for urgent ligation of the aneurysm with a femoro-popliteal bypass graft.

Case 3

A 73 year old man was referred to the outpatient clinic with worsening discomfort at the back of his right knee, this was aggravated by exercise, and associated with numbness and paraesthesia in his right ankle. This was thought at first to be a deep venous thrombosis. However, clinical examination confirmed a large popliteal artery

aneurysm. A duplex scan showed obstruction of the popliteal vein by a popliteal artery aneurysm, confirmed on CT scan as 7 x 10 centimetres in maximal dimension. He was admitted urgently for angiography, with a view to ligation of the aneurysm and femoro-popliteal bypass.

LEGENDS

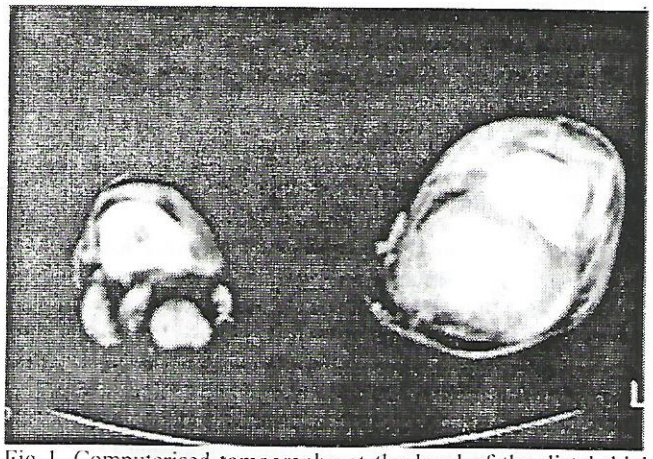

Fig 1. Computerised tomography at the level of the distal thigh showing false contrast filled mycotic aneurysm of the popliteal artery secondary to salmonellosis.

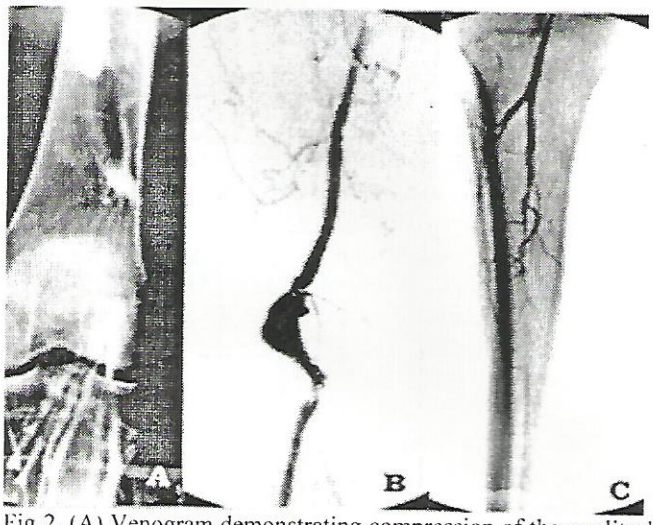

Fig 2. (A) Venogram demonstrating compression of the popliteal vein at the level of the proximal popliteal fossa. (B) Intra-arterial digital subtraction angiogram demonstrating the popliteal artery aneurysm responsible for the venous compression. (C) Angiogram demonstrating embolic occlusion of all three crural vessels, with only a segment of the peroneal artery refilling in the mid calf.

Soon after the angiogram, the patient began to complain of increasing pain in his calf and developed foot drop, presumably from pressure on the common peroneal nerve. The popliteal artery aneurysm was felt to have ruptured and he was taken to theatre immediately. The large popliteal aneurysm was ligated and a short femoro-popliteal bypass graft was performed using reversed long saphenous vein. His postoperative course was complicated by lower leg swelling, controlled with compression stockings and his residual foot drop has resolved. The graft remains patent on surveillance.

Discussion

Acute deep venous thrombosis of the lower limb is a common condition diagnosed frequently in both hospitalised patients and in the community. Popliteal artery aneurysms are rare though this is the most common site for peripheral arterial aneurysms[3]. Deposition of marginal thrombus is responsible for distal embolisation and occlusion, which are the most frequent complications. Rupture of the popliteal artery is rare accounting for 2%[1] - 4.8%[13] of all popliteal artery aneurysms in large series. Although rupture is rarely fatal, as haemorrhage is contained in the relatively confined popliteal space, it does mandate immediate surgery because of resulting severe pain and the threat of limb loss.

Larger aneurysms may cause mechanical effects by compression of the structures in the popliteal fossa and may present as deep venous thrombosis, arteriovenous fistul. following rupture into the popliteal vein, or with neurologic -l pain typically in the distribution of the sural nerve. Infectio. ~ an aneurysm is a rare event, accounting for 1-2% in large series[15]. Existing aneurysms may become secondarily infected or otherwise normal arteries may become infected from a distant source. These infected, weakened arterial walls become aneurysmal with a tendency to rupture, termed mycotic aneurysms. The popliteal artery appears to be a site of predilection for the formation of mycotic aneurysm, often with unusual organisms[11,14].

Popliteal artery aneurysm should always be considered in the differential diagnosis of an acutely symptomatic lower limb, particularly in male patients. It can be easily diagnosed clinically by palpating a prominent expansile pulse in the popliteal fossa and can be efficiently and rapidly confirmed non-invasively by Duplex scanning. Thrombosed popliteal artery aneurysms are however more difficult to diagnose as the aneurysm is no longer pulsatile, though it may still be palpable. A high index of suspicion is required to correctly diagnose a thrombosed popliteal artery aneurysm in an acutely ischaemic leg. Prompt diagnosis is important because inappropriate treatment of patients with unrecognised aneurysms appears to be associated with a high morbidity and mortality. Left untreated, the complications arising in popliteal artery aneurysms pose a serious threat to the affected limb. Unfortunately, there remains considerable debate as to what size, asymptomatic popliteal aneurysms should be repaired, though most authorities would agree that all symptomatic aneurysms should be operated upon.

The surgical treatment of popliteal aneurysm is dictated by the mode of presentation and associated complications. The aim is to re-establish the circulation to the lower limb with exclusion of the aneurysmal segment, disobliteration of the distal arterial tree, and debridement

of any infected tissue, if present. When identified and repaired electively, grafted popliteal arteries have long-term patency rates of greater than 90%[3,4,6]. In summary, because of the diversity of its presentation, an accurate diagnosis of popliteal aneurysm is often delayed, increasing the risk of further complications or rupture, resulting in a worse outcome even if surgery ensues.

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