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Incidental discovery of a long standing arteriovenous fistula after thrombectomy for acute lower limb ischaemia

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ABSTRACT

INTRODUCTION: Arteriovenous fistula (AVF) is the abnormal connection between an artery and vein. Congenital AVF of the popliteal artery is very rare.

PRESENTATION OF CASE: 89 year old lady presented with right acute lower limb ischaemia. She had unilateral chronic venous hypertensive change in the right leg. Femoral embolectomy was performed. Backflow was achieved. Arteriotomy was closed. The patient's leg continued to deteriorate. She returned to theatre. On-table angiogram showed an occluded SFA. Thrombectomy was completed. SFA was patent but no blood flowed into the distal popliteal artery. A second on table angiogram revealed AVF between popliteal artery and vein. Dissection to the posterior aspect of the knee revealed the fistula. The vein was arterialized and enlarged. The AVF was ligated. Normal distal blood flow was achieved. Retrospectively we measured the leg lengths. Right leg was 3 cm longer than the left. The right leg circumference was 7 cm greater than the left. She reported chronic venous change from a young age. She did not report any history of trauma to the limb.

DISCUSSION: Popliteal artery to popliteal vein fistula is a rare. Trauma is the most common cause of popliteal AVF. Should the condition develop before closure of the epiphyses, there may be an increase in leg measurements.

CONCLUSION: We postulate that this case of AV fistula may be congenital due to discrepancy in leg measurements and unilateral chronic venous hypertensive change. Rarely persistent remnants of the embryonic sciatic artery can lead to arteriovenous anastomoses, which may be a possible aetiology.

1. Introduction

An arteriovenous fistula (AVF) is the abnormal connection between an artery and vein that bypasses the capillary bed. They can be congenital or secondary to trauma or inflammation.[1] Congenital AVF of the popliteal artery is very rare, with few case reports in the literature.

2. Presentation of case

An 89-year-old lady was transferred to our hospital with progressive pain in her right calf radiating to her toes over the course of a few days. On presentation her right leg was acutely ischaemic. The patient reported parasthesia and decreased power. The patient had a background history of Type 2 diabetes mellitus, hypertension and atrial fibrillation. She was not on therapeutic anticoagulation.

On examination of the right lower limb there was a blue discoloration of the foot. She had signs of chronic venous hypertension in the right leg (Fig. 1a). Her right leg appeared to have a greater diameter when compared to the left leg (Fig. 1b). Her right leg was cold on palpation. Capillary refill was delayed. No pulse or thrill was palpable at the site of the popliteal artery, nor were the distal pulses palpable. Sensation in the limb was intact, however power was reduced. The clinical impression was that of acute limb ischaemia secondary to lower limb embolism. As she had an acute presentation, she did not undergo any pre-operative radiology or vascular investigations.

The patient was started therapeutically on a heparin infusion and brought emergently to theatre for a femoral embolectomy. A small embolus was retrieved, however the Foley catheter could not pass beyond the level of the popliteal artery. As there was reasonable backflow, the arteriotomy was closed.

The patient's leg continued to deteriorate post-operatively, with loss of sensation and further loss of power over 48 hours. CT peripheral angiography revealed an occlusion in the distal Superficial Femoral Artery (SFA). There was a discrepancy between the leg diameters. The right femoral vein was 4.2 mm greater in diameter

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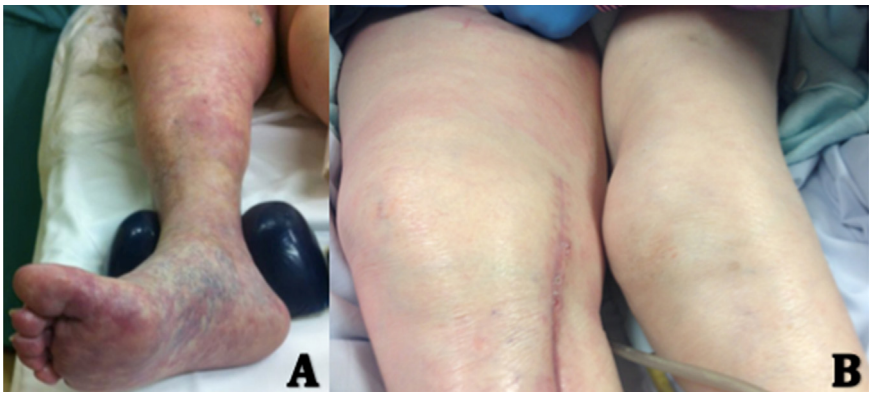

Fig. 1. (a) Signs of chronic venous hypertension. (b) Enlarged right leg compared to the left.

compared to the same point in the left leg (Fig. 2). The imaging also revealed signs of chronic arterial disease with vessel calcification.

The patient returned to theatre where an on-table angiogram showed an occluded SFA in the mid part. Below knee popliteal exposure was performed. Retrograde thrombectomy was completed through this incision to the SFA with subsequent angioplasty and stenting. Though the SFA was patent, no blood flowed into the distal popliteal artery. A second on table angiogram was performed through the groin incision revealed an unusual finding – a connecting fistula from the popliteal artery, filling the femoral vein, with lack of flow to the distal patent popliteal artery (Fig. 3).

Further dissection to the posterior aspect of the knee revealed a popliteal arteriovenous fistula, with all the blood from the artery draining directly into the vein. The vein appeared arterialized and enlarged. There was no evidence of dissection or extravasation of blood in this area. There was a continuous machinery signal on Doppler assessment. The fistula underwent open ligation. Endovascular stenting was not performed as the fistula was at the level of the joint. Following closure of the fistula, with repair of the popliteal artery and vein, normal flow was achieved into the anterior tibial artery, which was the only available outflow vessel. Medial and lateral fasciotomies were performed.

As this patent had prolonged ischaemia, she was left with significant motor deficit in the limb. At six weeks follow-up, the fasciotomy sites were healing well with the aid of vacuum assisted closure. Sensation was intact in her right lower limb, as were her peripheral pulses. The motor function in the leg was improving.

3. Discussion

Popliteal artery to popliteal vein fistula is a rare condition. Causes include trauma, from injury to the knee,[2] or iatrogenically after surgery.[3] Our patient did not report any history of trauma. Infection and malignancy can also predispose to fistula formation. A congenital arteriovenous fistula of the lower limb can also be seen. It can occur in syndromes such as Klippel-Trenaunay syndrome, or spontaneously, as is the apparent case with our patient. Spontaneous fistula may occur at sites of chronic atheromatous arterial disease.[4]

Arteriovenous fistulae can present with discrepancy in leg diameter. Should the condition develop before closure of the epiphyses, there may be an increase in leg length.[5] In retrospective measurement of the lower limbs six weeks post-operatively, her right leg was 3 cm longer than the left leg. There was also a discrepancy in the

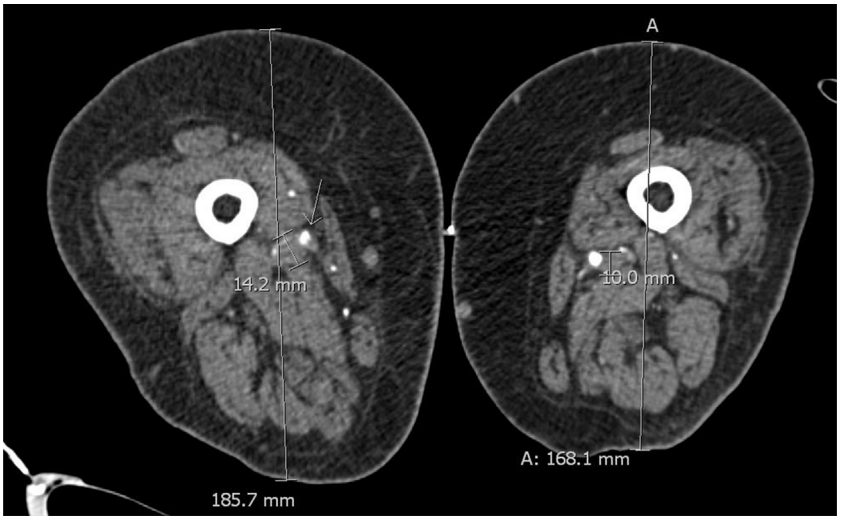

Fig. 2. CT peripheral angiogram prior to re-intervention shows discrepancy between diameters of the femoral veins in the right and left leg. It also showed a difference in radial leg diameter. There was significant calcification in the SFA (arrow).