Singapore Med J 2005; 46(8) : 426

Bilateral persistent sciatic arteries with unilateral complicating aneurysm

M E Aziz, N R N Yusof, M S Abdullah, A H Yusof, M I Yusof

ABSTRACT

Persistent sciatic artery is a very uncommon embryological vascular variant. This case report highlights this rare vascular anomaly, diagnostic difficulty, complication and subsequent treatment in a 43-year-old man who presented with sudden onset of right leg pain for a few hours. He was unable to walk because of pain and numbness. Emergency right lower limb angiogram showed a large aneurysm that was initially thought to arise from the right common femoral artery, associated with thrombus formation within the right popliteal artery. A below knee amputation was performed due to worsening ischaemia of the right leg. The persistent right sciatic artery was later obliterated using percutaneous stenting and endovascular grafting, with deployment of two wallstents.

Keywords: aneurysm, embryological vascular variant, persistent sciatic artery

Singapore Med J 2005; 46(8):426-428

INTRODUCTION

Persistent sciatic artery is rarely encountered. Its discovery is usually either accidental or following complications such as vascular insufficiency. Those who have not seen the lesion may regard this as a condition that is only described in literature. This case report describes the difficulty of its diagnosis and complication related to its late diagnosis. It stresses the importance of a multidisciplinary approach in dealing with vascular anomalies, as a delayed diagnosis may end up with permanent limb loss.

CASE REPORT

A 43-year-old policeman, who is a chronic smoker, presented with sudden onset of right leg pain for a few hours before his admission. He was unable to walk because of pain and numbness of the foot. He had a ten-year history of intermittent claudication. He had a similar episode of pain and foot numbness about two months before admission, but had never been investigated. He had no history of diabetes mellitus, hypertension or heart disease. On examination, his right foot was pale and insensate. His right femoral and popliteal pulses were present bilaterally but his right tibial posterior and dorsalis pedis pulses were absent. There was no other sign of ischaemic change. His cardiovascular and respiratory systems were normal.

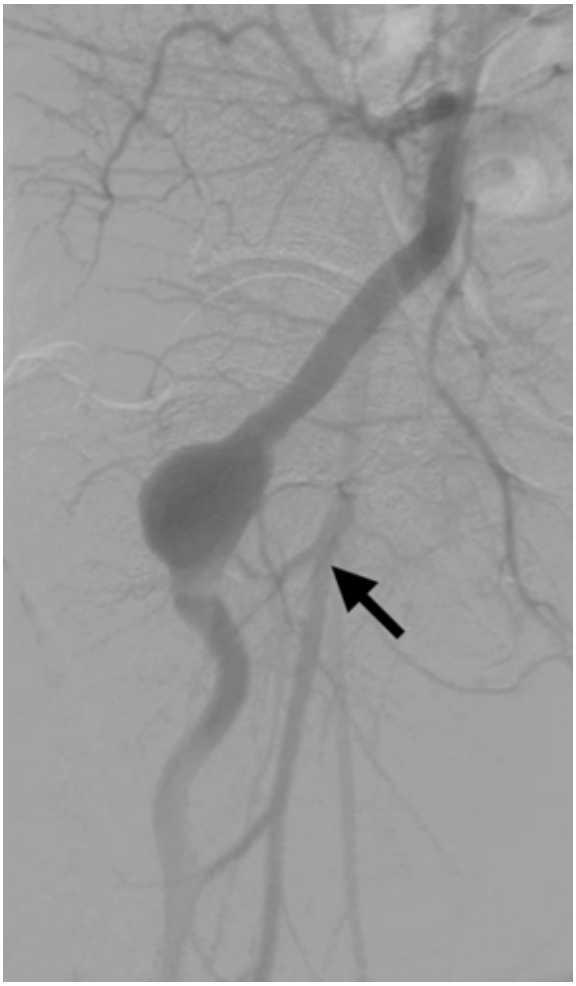

Fig. 1 Lower limb angiogram shows the aneurysm of the persistent sciatic artery which was mistakenly diagnosed to arise from the common femoral artery. The femoral arterial system is less prominent or hypoplastic (arrow).

Emergency right lower limb angiogram showed a large aneurysm that was initially thought to arise

Department of Radiology
School of Medical Science
Universiti Sains Malaysia
Jalan Raja Perempuan Zainab 2
16150 Kubang Kerian
Kelantan
Malaysia

M E Aziz, BSc, MD, MMed
Lecturer

M S Abdullah, MD, MMed
Lecturer

Department of Radiology
Kota Bharu Hospital
15100 Kota Bharu
Malaysia

N R N Yusof, MD, MMed
Radiologist

Department of Orthopaedics
School of Medical Science
Universiti Sains Malaysia

A H Yusof, MBBCh, MMed
Lecturer

M I Yusof, BSc, MD, MMed
Lecturer

Correspondence to:
Dr Mohd Imran Yusof
Tel: (60) 9 766 3000 ext: 4518
Fax: (60) 9 765 3370
Email: drimran@kb.usm.my or drimran93@yahoo.com

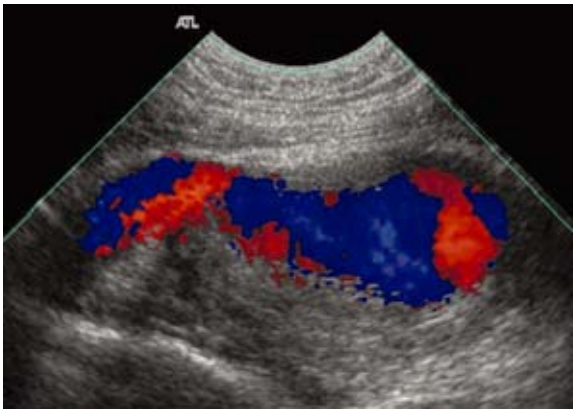

Fig. 2 Colour Doppler US image shows an aneurysmal dilatation of an artery in the right gluteal region, with turbulent flow and thrombus formation within.

from the right common femoral artery, associated with thrombus formation within the right popliteal artery (Fig. 1). Surgical exploration failed to identify any aneurysm. There was no run-off noted during the surgical exploration. A vascular surgeon, interventional radiologist, other related experts and facilities were not available in our centre at that time and therefore, thrombolysis could not be performed. Further assessment revealed a pulsatile mass at the right gluteal region, and subsequent radiological examinations that were performed showed focal vascular dilatation (Fig. 2). Urgent computed tomography (CT) angiography revealed bilateral persistent sciatic artery with a hypoplastic superficial femoral artery and right fusiform aneurysm, posteriorly located at the right ischial tuberosity (Figs. 3-4). As the condition of the right leg worsened and the level of ischaemia ascended, a right below knee amputation was performed. The persistent right sciatic artery was later obliterated using percutaneous stenting and endovascular grafting.

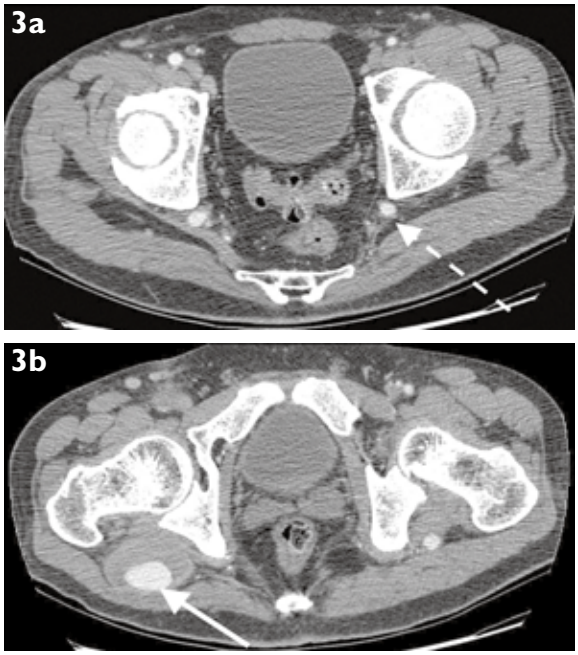

Fig. 3a & b Enhanced CT scan images of the pelvic show an aneurysm arising from the right internal iliac artery (white arrow). The left internal iliac artery is also prominent (dashed white arrows).

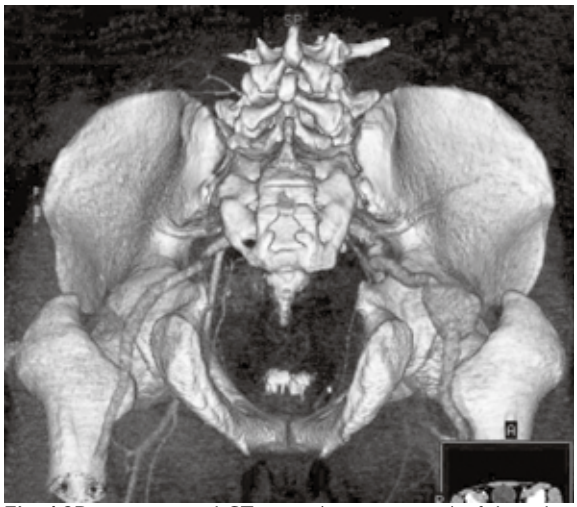

Fig. 4 3D reconstructed CT image (posterior view) of the pelvis shows the aneurysm arising from the right sciatic artery.

DISCUSSION

Persistent sciatic artery is a very rare vascular anomaly. Green reported the first case in 1832[1-3]. Bilateral occurrence is much more rarely encountered, with an incidence of 12%[4]. However, Mayschak et al reported bilaterality of persistent sciatic artery in 50% of cases[1]. The mean age at presentation has been found to be 45 years, with equal sex incidence[1]. Persistent sciatic artery can be divided into complete and incomplete types, based on presence of hypoplastic changes of femoral arterial system[5,6]. The complete type with hypoplastic or absent superficial femoral artery is more commonly encountered[1-3].

Embryologically, this vessel is the main supply to the primitive posterior tibial and peroneal arteries, and arises from the dorsal root of umbilical artery[3,5]. Its involution starts once the femoral artery develops until the latter replaces its function completely by the third month of gestation. Remnants of sciatic or axial artery are inferior gluteal, part of popliteal artery and peroneal artery[3]. This anomalous vessel is known to undergo aneurysm formation or atherosclerotic changes. This may present as a pulsating gluteal mass or ischaemia of the affected lower limb, as seen in our patient. Sciatica may also be one of the symptoms[5,7]. In older patients, presence of gluteal mass and pain may simulate soft tissue sarcoma[7].

Radiological investigations are important to identify, classify and aid in performing endovascular intervention. Doppler ultrasonography is a safe and

non-invasive modality to confirm the presence of aneurysm[1]. An aneurysm in the gluteal region with absent femoral but intact popliteal pulses may represent a persistent sciatic artery[2]. Angiography is regarded as the gold standard investigation to detect vascular lesions. However, angiographical findings can be misleading if it is not properly reviewed by an experienced radiologist. In our patient, the location of the aneurysm which overlapped with the femoral artery in anteroposterior angiogram misled both the radiologist and the surgeon. The anomaly was mistakenly interpreted as arising from right common femoral artery. A lateral angiogram was not performed as it is not routinely done due to its limitation to provide good images.

The diagnosis was not suspected as the managing team had never seen such a lesion before. It was only suspected a few days after the exploration when the patient himself complained of the gluteal swelling. Urgent CT angiography revealed bilateral persistent sciatic artery with hypoplastic superficial femoral artery and right fusiform aneurysm, posteriorly located at the right ischial tuberosity. Unfortunately, at that time, the diagnosis was already late, as the foot was already gangrenous. It was concluded that its rarity, anatomical variant and the more posterior location of the lesion are the main reasons why the lesion was missed.

Contrast-enhanced CT scan with 3D reconstructed images clearly revealed the aneurysm with its relationship. This technique, also called CT angiography, is very useful in the assessment of the thoracic, abdominal, renal and pelvic vascular systems. It is known to be superior to ultrasonography in assessment of abdominal aortic aneurysm, and comparable to angiography for vascular assessment of large and medium-sized arteries. Only its temporal resolution limits its use in detecting vascular lesions involving the small-sized arteries. In our case, CT angiography gave a clear relationship of the lesion and the adjacent structures. Magnetic resonance (MR) angiography is another modality that can delineate this vascular anomaly. Shinozaki et al showed a MR image indicating the presence of persistent sciatic artery[7]. Limitations of this modality include its high cost, availability and technical difficulty.

Treatment of persistent sciatic artery aneurysm is surgical or by endovascular intervention. Exclusion of the aneurysm can be achieved by ligation, excision or vascular stenting. Vascular reconstruction can be performed by femoropopliteal bypass, iliopopliteal transobturator bypass or interposition bypass[5]. In the past, end-to-end anastomosis after aneurysmectomy using venous graft and Dacron interposition graft was another option[1]. The options should be based on angiographical findings to ensure adequate vascular supply distal to the aneurysm.

Endovascular approaches include intravascular wall stenting and coiling of the aneurysm. These options are considered to obliterate aneurysm with maintenance of vascular patency. Presence of arterial stenosis or atheromatous plaques can be treated by angioplasty[6] while presence of embolism requires balloon embolectomy[2]. For follow-up, de Boer et al suggested regular clinical assessment and annual duplex ultrasonographical assessment to exclude recurrent aneurysm[4]. As for our patient, the aneurysm of the right persistent sciatic artery was later treated via endovascular approach with deployment of two wallstents (Wallgraft TM Endoprothesis, Boston Scientific). The aneurysm was completely occluded and normal flow of the parent artery was preserved. Assessment with doppler ultrasonography at one and three months following the procedure showed patency of artery without signs of ischaemia.

ACKNOWLEDGEMENTS

We would like to thank Dr Ibrahim Lutfi Shuaib and Dr Abd. Rahman Mohd Ariff from Department of Radiology, School of Medical Sciences, USM, Dr Myint Tun from the Department of Surgery, School of Medical Sciences, USM, and Dr A Adam Pany from Sunway Medical Centre for their participation in the management of this patient.

REFERENCES

1. Mayschak DT, Flye MY. Treatment of the persistent sciatic artery. Ann Surg 1984; 199:69-74.
2. Williams LR, Flanigan DP, O'Connor RJA, et al. Persistent sciatic artery. Clinical aspects and operative management. Am J Surg 1983; 145:687-93.
3. McLellan GL, Morettin LB. Persistent sciatic artery: clinical, surgical, and angiographic aspects. Arch Surg 1982; 117:817-22.
4. de Boer MT, Evans JD, Mayor P, et al. An aneurysm at the back of a thigh: a rare presentation of a congenitally persistent sciatic artery. Eur J Vasc Endovasc Surg 2000; 19:99-100.
5. Batchelor TJP, Vowden P. A persistent sciatic artery aneurysm with an associated internal iliac artery aneurysm. Eur J Vasc Endovasc Surg 2000; 20:400-2.
6. Freeman MP, Tisnado J, Cho SR. Persistent sciatic artery. Report of three cases and literature review. Br J Radiol 1986; 59:217-23.
7. Shinozaki T, Arita S, Watanabe H, et al. Aneurysm of a persistent sciatic artery. Arch Orthop Trauma Surg 1998; 117:167-9.