

» Case Report «

The Management of Persistent Sciatic Artery Aneurysm with Lower Extremity Ischemia: A Case Report

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We report a case of lower extremity ischemia caused by a persistent sciatic artery aneurysm. The patient was successfully treated with a ringed expanded polytetrafluoroethylene (ePTFE) graft and recovered uneventfully. The graft was patent during the follow-up and no signs of kinking or restenosis.

Keywords: persistent sciatic artery, aneurysm, duplex scanning

INTRODUCTION

Persistent sciatic artery (PSA) is a rare congenital vascular anomaly with an incidence of 0.03%–0.06%.¹⁾ The anatomic characteristic of the artery has brought various complications such as atherosclerosis and aneurysm formation.²⁾ The latter had a relatively high incidence of 48% and could be associated with lower extremity ischemia which may result in amputation.¹⁾ We report a PSA aneurysm with lower extremity ischemia treated with a ringed graft.

CASE HISTORY

A 62-year-old underweight woman complained of a pulsatile mass in the right buttock and claudication for 9 months without any related recent trauma or surgery. The ankle brachial index was 0.77, indicating mild ischemia. She experienced coldness and paresthesia of the right leg. Examination of her right lower extremity revealed a weak palpable femoral artery pulse but no distal pulses. The pulsatile mass in the buttock was about 5 cm with a mild tender and clear boundary. The contralateral arteries were all clearly palpable.

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Duplex ultrasound (DU) scanning and computed tomography angiography (CTA) were conducted. DU scanning showed a semi-thrombotic enlargement of the sciatic artery with both proximal and distal arterial wall hypertrophied. The aneurysm sac was shuttle-shaped and 4 cm in diameter. Subsequent CTA revealed the panorama of the PSA aneurysm (**Fig. 1**). As illustrated by the images, the aneurysmal artery has a stenosis at the distal neck (**Fig. 1**, arrow) which may be responsible for the lower extremity ischemia. The PSA had substituted the femoral artery as the main blood supply of the lower extremity. The popliteal artery was the continuation of the PSA. Compared to the contralateral normal femoral artery system, the affected arteries were circuitous and hypoplasia, which may aggravate the distal ischemia.

Open surgery was performed with a ringed graft (Gore-Tex, USA) in a prone position. An incision was made in the right buttock over the course of the PSA. The aneurysm sac was exposed entirely with two ends dissected till normal segments. The aneurysmal sac was then opened and transplantation was performed using an 8-mm graft within the sac. The graft ends were both sutured to the normal arterial segments, and the wall of the sac was closed over the graft (**Fig. 2**). The whole procedure was conducted within the aneurysm sac to minimize the adverse impact on surrounding tissues, such as the sciatic nerve. Six days later, the ankle brachial index was 0.82, and previous clinical ischemic symptoms had improved subjectively.

Pre-discharge DU scanning was carried out and showed a patent graft with a triphasic flow pulse (**Fig. 3A**). The patient made an uncomplicated recovery with



Fig. 1 Computed tomography angiography of the PSA aneurysm. (A) The aneurysmal PSA and stenosis at the distal neck. (B) The anatomy of lower extremity arterial system. PSA: persistent sciatic artery

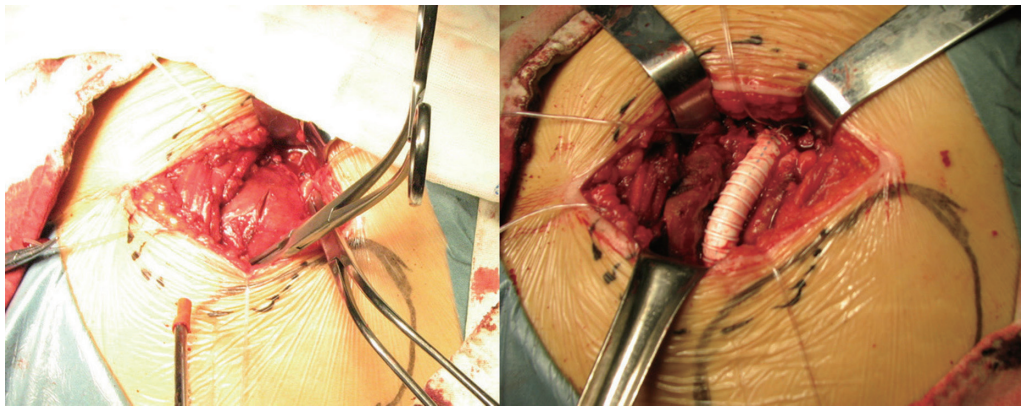


Fig. 2 The transplantation of ringed graft within the PSA aneurysm sac. PSA: persistent sciatic artery

improvement of ischemia symptoms. Three months later, the patient came back without any related complaints, and DU scanning suggested no kinking or restenosis (**Fig. 3B**). One year later, she reported no recurrent symptoms via telephone.

DISCUSSION

During early embryonic development, the sciatic artery is the axial artery of the lower limb which supplies the entire leg. When the femoral artery system develops and become dominant, the sciatic artery involutes. But if normal development fails, the sciatic artery may persist,

instead of regressing supplying the lower extremity. The anomaly is rare with the incidence of 0.03%–0.06%, but related complications may result in amputation in 8% of the cases.¹⁾ The PSA originates from the internal iliac artery and runs through the sciatic notch entering the adductor magnus along the dorsal aspect of the lower extremity. There are two types of PSA recognized: complete sciatic artery is the continuation of the internal iliac artery and turn into popliteal artery in the popliteal fossa; an incomplete type is just like the sciatic artery remnants acting as the collateral braches connecting the internal iliac artery and popliteal artery while a complete femoral artery system is the dominant blood supplier.

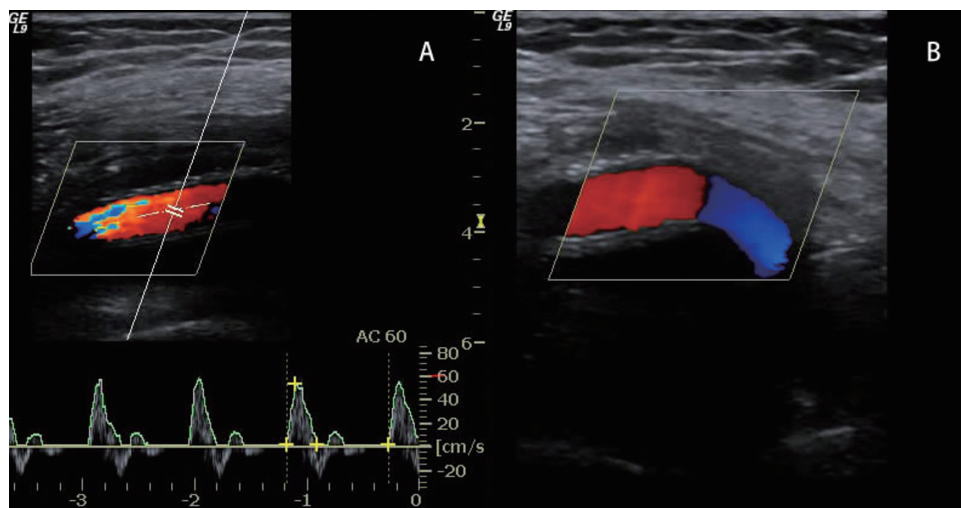


Fig. 3 (A) Pre-discharge DU scanning showed a patent graft with triphasic pulse. (B) The distal anastomosis at 3 months after graft interposition, DU showed a patent in-graft flow. DU: duplex ultrasound

The PSA is susceptible to aneurysm formation which is probably due to the superficial position in the buttock and repeated external trauma.²⁾ A PSA aneurysm may result in severe complications, including neurologic symptoms due to sciatic nerve compression, tenderness in the buttock, ipsilateral lower extremity ischemia and rupture.³⁾

The treatment for PSA aneurysm depends on the anatomy and symptoms presented. Options for intervention include graft interposition, extra-anatomic bypass, embolization and endovascular stent implantation. Open surgery for PSA remains controversial and is not recommended for asymptomatic patients.^{1, 4, 5)} The drawback is mostly because of the close proximity of the PSA to the sciatic nerve, which may contribute to iatrogenic adverse outcomes.

Here, we present a patient who had a complete PSA with a hypoplasia femoral artery system. Therefore, the PSA should be preserved or aneurysm be excluded for extremity blood supply. Coil embolization won't be appropriate method for this case. The advantages of graft interposition and endovascular stent implantation are less invasive operation and shorter procedure time compared to bypass surgery. Considering the position of the aneurysm and the slim somatotype, we assume the endovascular stent may be fractured or distorted and thrombosed. As the long-term results were not as sure as the open surgery, we at last chose the graft transplantation. A ringed ePTFE graft was appointed for the external support to increase the graft resistance to compression and reduce kinking risk. In addition, the circuitous part

of the artery was replaced by the graft and guarantees the blood flow. The whole procedure was completed within the aneurysm sac to maintain the sciatic nerve intact and the patient recovered without any neurologic symptoms.

As endovascular therapy is widely used for PSA management,^{1, 6, 7)} open surgery still has its own merits and should be taken into consideration in some special cases.

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