A Combined Open and Endovascular Approach to Treat a Persistent Sciatic Artery Aneurysm in an Obese Patient

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Persistent sciatic artery is a relatively uncommon peripheral vascular malformation of the lower extremity arterial blood supply that is often misdiagnosed. We present a case report of a 52-year-old, obese female who presented to our center with symptoms of lower extremity ischemia. We describe a novel approach combining open and endovascular techniques for the treatment of a persistent sciatic artery aneurysm, providing maximal benefit, while minimizing potential complications due to her co-morbidities.

Key words: persistent sciatic artery, endovascular intervention

INTRODUCTION

The sciatic artery is a remnant of the lower limb circulation in the early embryonic period and is a direct branch of the umbilical artery. Generally, this artery involutes as the femoral circulation from the internal iliac artery develops. However, rarely this sciatic artery persists and is the main supply of blood to the lower leg. This persistent sciatic artery (PSA) has an overall incidence of 0.025%–0.04%. Complications arising from this aberrant circulation include aneurysm formation, thrombosis, as well as Rupture. Multiple treatment modalities have been utilized for management of these complications, ranging from ligation to endovascular interventions. We report a case of a 52 year-old lady who presented with a pulsatile buttock mass and lower limb ischemia who was found to have a PSA. We utilized a combined open and endovascular approach secondary to her obesity to offer her the best treatment with lowest morbidity.

CASE

A 52-year-old female presented to the hospital complaining of a two-day history of left foot pain. The patient stated the pain was primarily localized to her toes. Her foot was warm; however, she did not have palpable DP or PT pulses. She was admitted, placed on a heparin drip, and a computed tomogram was obtained. The imaging revealed a PSA aneurysm providing the only inflow to the above-knee popliteal artery. The common femoral artery was patent below the inguinal ligament and fairly large.

After review of the patient’s films and exam, a bypass procedure was chosen to treat the PSA aneurysm. However, the more common approach to bypass from the iliac to the above-knee popliteal with proximal and distal ligation of the PSA was not selected. To perform this procedure would have required an abdominal incision underneath the patient’s large pannus which almost ensured a wound infection and possible subsequent graft infection. Therefore, the patient was taken to the operating room where a femoral to above-knee popliteal bypass was performed using reverse saphenous vein graft. The distal end of the PSA was also ligated after the completion of the distal anastomosis, and the arteriogram showed good inflow to the lower leg. On the first post-operative day, the patient was taken to the endovascular suite where arterial occlusive devices where placed to exclude the aneurysm proximally. The patient recovered well and was discharged home after four days.

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Fig. 1  Computed tomography of the left leg showing the persistent sciatic artery aneurysm and the femoral arteries.

Fig. 2  Completion arteriogram of femoral to above-knee popliteal bypass.

Fig. 3  Pre and post endovascular exclusion of PSA aneurysm. (black arrow pointing at aneurysm) PSA, persistent sciatic artery

**DISCUSSION**

Persistent sciatic arteries most commonly present with aneurysmal formation, reported in up to 42% of Patients.\(^1\,^5\) This may be complicated by thrombosis or rupture, which is contributed to congenital hypoplasia of the artery. Anatomically, the artery arises from the umbilical artery and runs along the dorsal aspect of the lower limb, giving rise to the popliteal, peroneal and tibial arterial systems. The femoral system arises from the external iliac artery, and by the third month of gestation, it coalesces with the sciatic artery, to become the dominant arterial supply of the lower extremity. At this time, the sciatic artery regresses, leaving behind only the external gluteal artery and the artery of the of the sciatic nerve.\(^6\) Anatomic variations in the persistent sciatic artery depend on this process of involution.

Clinically, the patient usually presents with a pulsatile buttock mass, with or without acute ischemic pain. This may result in a misdiagnosis of atherosclerotic occlusive
disease of the lower limb, leading to unnecessary procedures that do not resolve the patient’s symptoms. Digital subtraction arteriography (DSA) continues to be the gold standard for imaging, but CTA and MRA have also been used for this Purpose.6) DSA often fails to show the relation of the anomaly with the surrounding structures, leading to a misdiagnosis.7) Promising results were shown in 2005, when Jung et al. proposed using a multidetector row spiral computed tomography (CT) scanner, scanning from the iliac bifurcation to the feet.7) This can be used as a single modality, since with 3D reconstruction, it is possible to define the anatomic relations as well distal out-flow vessels.

Definite management of a persistent sciatic artery is warranted in symptomatic patients. Due to the multiple anatomic variations, treatment options need to be tailored according to the type of PSA, the femoral circulation, presence or absence of aneurysmal disease and/or concomitant vascular occlusive disease. PSA aneurysms have been managed by both open and endovascular techniques.8–10) Ligation of aneurysm via transgluteal approach has been described; however, this may lead to critical lower limb ischemia in the case where the PSA is the sole blood supply.4) Therefore, some sort of a revascularization procedure must be employed, as well. This may be difficult if the femoral vessels are hypoplastic. The obturator bypass approach employed by Urayama et al. is a viable option but presents technical difficulties especially in an obese patient.11 Endovascular approaches have been used, including deployment of stents and coil embolizations.10) However, the long-term results of these are largely unknown, and the anatomic position of the aneurysm exposes the risk of trauma, fracture and embolization of the devices when the patient sits. Persistent sciatic arteries present a risk of recurrence due to the presence of feeder vessels inside, thereby making simple exclusion more likely to result in failure.12, 13)

CONCLUSION

We described a combined open and endovascular approach to treat a PSA aneurysm. The open femoral to popliteal bypass provides the best revascularization to the leg with the opportunity to distally ligate the PSA. The success of this procedure depends on the size of the femoral arteries and might not be possible if they are severely hypoplastic. The endovascular approach to proximally ligate the PSA avoids the abdominal incision that in this patient would be placed underneath her large pannus. This combination procedure should provide similar results as an iliac bypass without wound morbidity in this obese patient.

REFERENCES