A Rare Case of Combined Bilateral Persistent Sciatic Artery with Unilateral Pseudoaneurysm

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Abstract

Persistent sciatic artery is a very rare vascular development anomaly with prevalence of 0.03-0.06% based on angiography. Majority of these patients are asymptomatic and usually present due its complications such as aneurysmal dilatations, thrombosis & distal thromboembolic phenomena. We report a case of 50 years old women who presented with swelling and pain in left gluteal region. CT angiography and ultrasound showed, bilateral PSA, complete on left side and incomplete on right side with pseudo-aneurysm on left side. She was managed successfully by endovascular stenting and is under regular follow up.

Keywords: Computed tomographic angiography, persistent sciatic artery, pseudoaneurysm

INTRODUCTION

Persistence of the primitive sciatic (Ishiadic) artery is a rare but interesting and clinically pertinent vascular anomaly. The first description of a persistent sciatic artery (PSA) was published by Green in the Lancet in 1832. This condition typically remains asymptomatic until it presents with aneurysmal disease, thrombosis or embolism, leading to ischemia. Familiarity with this entity is important in avoiding the ischemia (limb loss) and mortalities associated, avoiding inadvertent interventions as in cases where a supplementary artery occlusion is incorrectly diagnosed.

Here, we report a case of bilateral combined PSA with pseudoaneurysm and distal thromboembolism on left side and describe the potential scope of computed tomographic (CT) angiography in diagnosis, endovascular management, and follow-up.

CASE REPORT

A 50-year-old hypertensive woman alleged to have fall 20 days back presented with complaints of pain and swelling in the left buttock which progressively increased in size over 5 days. Local examination showed a pulsatile mass in the left gluteal region with no skin changes.

All the peripheral pulses were palpable except the left distal anterior tibial artery (ATA) and PTA. The left superficial femoral artery (SFA) was feeble. Doppler ultrasound of left buttock showed cystic swelling with turbulent color flow [Figure 1].

After appropriate medical investigations, aorto peripheral CT angiography was performed on 128 slice multidetector CT (MDCT) (general electric). 100 cc nonionic (400 mg/ml) iodinated contrast media were injected at rate of 4 ml/s. Postprocessing techniques (maximum intensity projection, volume rendering, and curved planar reformation) were used to better evaluate the whole peripheral circulation.

Computed tomographic angiography of the left leg
Large abnormal artery arising from dilated left internal iliac artery passing through sciatic notch, gluteal region, and posterior thigh with aneurysmal formation at level of greater trochanter [Figure 2]. Distal to the aneurysm, the...
artery was dilated, tortuous, and finally continued as popliteal artery [Figure 3]. It was diagnosed to be PSA. Left external iliac, deep femoral, and superficial femoral arteries showed reduced caliber. SFA tapered slowly in the distal thigh with no communication with popliteal artery. There was segmental occlusion of distal popliteal artery, tibioperoneal trunk and osteoproximal ATA with distal reformation of ATA and PTA.

**Computed tomographic angiography of right leg**

Similar abnormal artery was found with same origin and course terminating at distal thigh with muscular branches. The caliber was, however, reduced in size compared to the left side [Figure 3].

A final diagnosis of combined bilateral PSA complete on left side with aneurysm and incomplete on right side was made.

Through right femoral endovascular access, complete aneurysm exclusion was performed by wall graft stent and postdeployment balloon angioplasty was done [Figures 4 and 5].

Follow-up imaging showed occluded pseudoaneurysm with mildly ectatic vessel and covered stent graft in situ with no leak [Figure 4].

**DISCUSSION**

PSA is a very rare vascular anomaly with incidence estimated to range between 0.03% and 0.06%. Bilaterally, PSA are reported in 18%–22% cases.

**Embryology**

The sciatic artery is the axial artery of the lower limb and provides the blood supply during early stages of embryonic development. It normally regresses to form the proximal part

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**Figure 1:** Ultrasoundography of the left gluteal region showing fusiform cystic lesion with color uptake and turbulent waveforms

**Figure 2:** Three-dimensional maximum intensity projection and volumetric rendering techniques images showing the reduced caliber of superficial femoral artery (transparent arrows) on the left side and persistent sciatic artery (bold arrows) with aneurysm on left side (☆☆) also note the dilated tortuous left internal iliac artery (yellow arrow)

**Figure 3:** Computed tomographic axial contrast images showing course and caliber of persistent sciatic artery and superficial femoral artery. Complete type persistent sciatic artery on left side continuing as popliteal artery. Incomplete on right side terminating in thigh

**Figure 4:** Computed tomographic axial sections showing aneurysm on plain (a) and contrast enhanced (b) scans. Follow-up (c) scan with stent in situ and sealed off aneurysm (*). Three-dimensional curved multiplanar reconstruction images of persistent sciatic artery on left side preoperative (d) and postoperative (e) with wall graft stent (arrow) in situ and obliterated aneurysm (*
of the inferior gluteal artery after the 3rd month of embryonic life following the development of the femoral artery from the external iliac artery. Failure in development of the femoral system or noninvolution of the axial system generates PSA.

Among many different classifications, most commonly used “complete and incomplete type” are based on relationship between sciatic and femoral artery.

Complete type, the most common form, PSA continues as popliteal artery and represents the dominant supply for lower limb while SFA is hypoplastic and provides collaterals as seen in our case on the left side.

In incomplete type, PSA is hypoplastic and SFA is main blood supply to lower limb as seen in our case on the right side.

Most of the patients with PSA remain asymptomatic, diagnosed usually as an incidental finding during arteriography or secondary to complications, such as pulsatile gluteal mass, neurological symptoms due to compression of sciatic nerve by dilated aneurysm, and vascular insufficiency of lower limb.

Aneurysmal formation is seen in 15%–46% of PSA cases and is usually seen behind the greater trochanter. High incidence of aneurysm is due to repeated external trauma as the PSA is in a relatively vulnerable anatomic position and congenital lack of arterial elastic tissue.

Clinically, PSA should be suspected in patients with absent or feeble femoral pulses and palpable popliteal and/pedal pulses (COWIE’S pathognomonic sign).

The simple diagnostic imaging criteria for location of PSA are visualization of a large artery along the posterior aspect of the pelvis and the presence of an enlarged internal iliac artery compared to the homolateral external iliac artery.

Ultrasonography Doppler, CT angiography, or magnetic resonance angiography are the useful tools which aid in the diagnosis.

Conventionally, the diagnosis of PSA has been achieved by conventional angiography. The characteristic angiographic findings include enlargement of the internal iliac artery and/or a hypoplastic SFA terminating as small branches in the distal thigh. It is, however, often difficult to visualize the popliteal and tibial vessels using conventional angiography and this can lead to the erroneous impression that occlusion is present. Failure to visualize the popliteal and tibial vessels can be related to slow flow in the dilated artery or failure to place the catheter tip proximal to the internal iliac orifice.

Advances in MDCT technology have given CT an increasing role in establishing the diagnosis of a PSA and clarifying its relationship to the surrounding nerves, vessels, and musculoskeletal structures, which aids surgical planning. CT angiography can reveal aneurysm formation, the degree of intraluminal thrombosis, and associated venous anomalies. It can also demonstrate a totally occluded artery that cannot be seen on conventional angiography.

An asymptomatic PSA does not require operative management. It should, however, be monitored due to the high risk of thromboembolic complications. Depending on the clinical presentation and anatomy, surgery or endovascular intervention procedure with coil and Gelfoam embolization, or both, can be used to treat a PSA.

Endovascular interventions can avoid risks associated with surgery due to its proximity to sciatic nerve. In complete PSA, where distal revascularization is necessary, endovascular stent grafts provide treatment option. Whereas in incomplete PSA, percutaneous embolization with coils or balloons has been successful.

CT angiography can, therefore, serve as the new standard tool to assess and treat any thromboembolic complication or atherosclerotic change, in addition to providing comprehensive evaluation. The occluded vascular structure at the course of the sciatic nerve as well as the smooth tapering of the SFA and the distal stump of the PSA are helpful CT angiography findings in the diagnosis of a totally occluded PSA.

**Conclusion**

During assessment of any patient with signs and symptoms of distal limb ischemia, anatomical, and embryological anomalies must be considered. PSA, a rare vascular anomaly, can be diagnosed by CT angiography. This serves as a new standard diagnostic tool for complete assessment of the disease and treatment planning. Familiarity with this condition is a must to avoid inadvertent intervention in ischemia caused by PSA that can be erroneously diagnosed as SFA occlusion. Our case illustrates how an accurate diagnosis and comprehensive evaluation of potential complications caused by a PSA may be achieved using MDCT angiography.

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Conflicts of interest

There are no conflicts of interest.

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