

## **Bilateral Persistent Sciatic Arteries with Failed Iliofemoral Grafts**

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**Persistent sciatic artery (PSA) is an extremely rare embryological vascular anomaly, which could predispose to aneurysm formation, vascular stenosis or occlusion leading to limb ischemia.**

**We present a case of 67 year-old lady who presented with three months history of right foot non-healing ulcer. She had an attempt of right lower limb angioplasty via antegrade right common femoral artery approach but failed due to presumed access difficulties. Lower limb CT angiogram revealed bilateral persistent sciatic artery.**

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Persistent sciatic artery (PSA) is a continuation of the internal iliac artery, which exits the pelvis through the sciatic foramen to continue in the posterior compartment of the thigh. Its diagnosis is usually either incidental or following complications such as chronic or critical arterial insufficiency or aneurysm formation<sup>1</sup>.

The aim of this presentation is to report a rare case of bilateral persistent sciatic artery, the clinical presentation, technical difficulties during catheter angiography and the recommended approach for angioplasty in patients with PSA.

### **THE CASE**

A sixty-seven year old lady presented with 3 months history of non-healing right forefoot ulcer. She was a known case of type II diabetes, hypertensive, ischemic heart disease, post coronary bypass surgery and peripheral arterial disease with a previous left above knee amputation 16 years prior to the current presentation.

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Clinical examination revealed a pale right foot and 2 cm ulcer over the dorsum of the forefoot; the femoral, popliteal and posterior tibial pulses were present. The dorsalis pedis pulse was absent. There was no evidence of gangrene. There was no evidence of osteomyelitis on plain X-ray of the foot.

This patient had a good femoral pulse; therefore, it was decided to proceed to angioplasty without preliminary imaging largely because inflow disease was excluded on clinical grounds. It was thought that ankle-brachial index (ABI) and either CTA or MRA were not necessary.

Angiography was attempted via right antegrade common femoral artery (CFA) approach using fluoroscopic guidance but was not successful as the wire always takes the course of the profunda femoris artery. Angiogram was performed through the needle at the access site which again revealed the profunda femoris artery but no evidence of superficial femoral artery (SFA). Angiogram via left radial artery approach was attempted but unfortunately failed due to severe radial artery vasospasm occurring immediately after the arterial puncture. The procedure was abandoned and CT angiography was performed, which revealed bilateral persistent sciatic arteries with hypoplastic SFA on the right side, see figure 1 (a,b). There was a focal tight stenosis at the distal right common iliac artery (CIA) and diffuse disease throughout the PSA but most significant stenosis is seen just as it exits through the sciatic foramen.

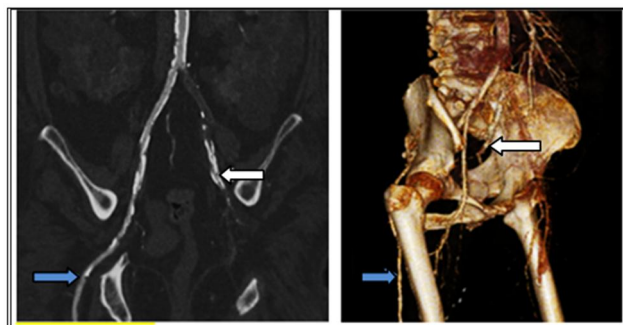
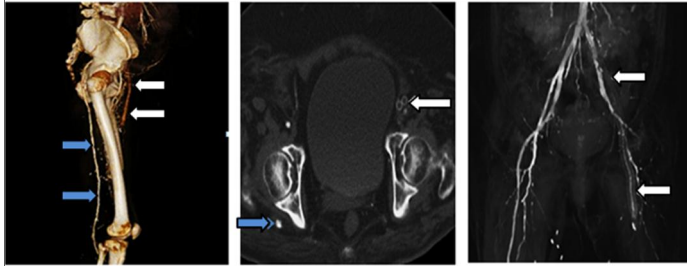


Figure 1 (a)

Figure 1 (b)

**Figure 1 (a,b): Coronal Reconstruction (a) and Volume Rendering (b) from Lower Limbs CT Angiogram Showing Bilateral PSA Which Is Patent but Diffusely Diseased on the Right Side (Blue Arrows) and Thrombosed from the Origin on the Left Side (White Arrows)**

This patient had two previous left iliofemoral grafts. Based on patient's record left above knee amputation sixteen years ago was done, see figure 2 (a,b,c). This indicates that the two prior grafts had failed which is expected in patients with PSA as the graft basically improves the flow to the profunda femoris artery but not the PSA which is the main blood supply to the lower extremity. Unfortunately, the full course of the PSA on the left side could not be traced distally due to the thrombosis and amputation. A second incidental finding is bilateral polycystic kidney disease, see figure 3. To our knowledge, none of the previously reported cases had polycystic kidney disease and the association in this case is probably incidental.



**Figure 2 (a)**      **Figure 2 (b)**      **Figure 2 (c)**

**Figure 2 (a,b,c): Volume Rendering (a) Axial Image at the Level of the Hip Joint (b) Axial MIP Images (c) for the Same Patient Showing the Posterior Course of the Complete PSA on the Right Side (Blue Arrows). The White Arrows Show the Two Thrombosed Left Iliofemoral Grafts.**



**Figure 3: Axial CT Image for the Same Patient Showing Bilateral Polycystic Kidneys**

Angioplasty via brachial is the only approach which would provide access to treat the stenosis in the right inflow arteries and PSA. Alternatively, this patient could be treated by iliopopliteal bypass graft and exclusion of the PSA<sup>2</sup>.

## **DISCUSSION**

Persistent sciatic artery is a very rare vascular anomaly. The first case was reported by Green in 1832<sup>1</sup>. The incidence of PSA has been estimated as low as 0.025-0.04%<sup>2</sup>. The condition has slight male predominance<sup>3</sup>. This makes this case report even more interesting as the patient was female. Only 93 cases of PSA had been reported up to 2007<sup>4</sup>. This is the first case to be described in the Kingdom of Bahrain.

PSA represent continuation of the inferior gluteal artery. Normally, it involutes during early fetal development<sup>5</sup>. It passes through the greater sciatic foramen and continues along the posterior surface of the adductor magnus muscle and continues as the popliteal artery<sup>6</sup>. The course of the artery in the case report is exactly as described in the literature.

PSA could be complete and incomplete. In the complete form, which is more common, it exits the pelvis through the greater sciatic foramen and descends adjacent to the sheath of the sciatic nerve and continues as the popliteal artery. In the incomplete form, the PSA is interrupted

superiorly at the internal iliac artery or inferiorly at the popliteal artery with an intact SFA. These patients are usually asymptomatic. These patients could present with stenosis, thrombosis or aneurysm formation<sup>6,7</sup>. Failure to appreciate the persistent sciatic artery as the main inflow into the lower extremity may lead to inappropriate bypass surgery of apparent occlusive disease of the presumed superficial femoral artery. In this case report, two iliofemoral grafts were performed on the left side which are thrombosed in the current CT angiogram.

We speculate that the anomaly was not recognized prior to the surgery, which led to inappropriate management and eventually above knee amputation. Treatment depends on the presentation. Aneurysms can be treated by ligation, embolization or exclusion by endovascular stent graft. Occlusive atherosclerotic disease can be treated by femoral-popliteal or iliopopliteal bypass graft<sup>8</sup>. Polycystic kidney was found in this case, which to our knowledge was never reported in association with PSA. This could be an incidental finding; however, it opens the door for further future research to investigate the association between PSA and polycystic kidney disease.

## CONCLUSION

**Persistent sciatic artery is a rare arterial embryologic anomaly; it is prone to early atheromatous degeneration leading to stenosis or occlusion and aneurysm formation, commonly at the site of compression where it exits the sciatic foramen. Failure to recognize the anomaly may lead to mismanagement and serious complications. Treatment of a PSA is mainly dependent on the symptoms either by surgical procedures or by endovascular interventions.**

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