

BILATERAL PERSISTENT SCIATIC ARTERIES – A CASE REPORT

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ABSTRACT

Case - A 53 year old male presented in the surgery OPD with complains of pain and swelling in bilateral lower limbs aggravated on walking and relieved on rest. There is history of Diabetes Mellitus since 8 years. There is no history of tobacco consumption. Clinical examination revealed oedema of bilateral feet with decreased clinically palpable dorsalis pedis pulsations bilaterally. The CT angiographic study of the lower abdominal aorta and both lower limbs reveal an anomalous course of bilateral internal iliac arteries seen coursing along sciatic notch, known as sciatic artery, and forming the popliteal artery and anterior tibial/posterior tibial artery on either side. The external iliac, the Superficial femoral and profunda femoris on either side appears small caliber vessels and superficial femoral runs a short course. All the arteries of both lower limbs reveal diffuse atherosclerotic changes in form of diffuse atherosclerotic calcification but there is no stenosis seen.

In this paper we discuss this case of bilateral persistent sciatic arteries and review various theories regarding its embryological basis, along with the presentation, diagnosis, and treatment.

Conclusion - A superficial course through the buttock renders the persistent sciatic artery susceptible to repetitive trauma from sitting and hip flexion-extension. This, coupled with congenital arterial wall hypoplasia, can result in early atherosclerosis and aneurysm formation which in turn can compress the adjacent sciatic nerve.

KEYWORDS : Bilateral Persistent Sciatic Arteries, Atherosclerosis, Aneurysm**INTRODUCTION –**

Persistent sciatic artery (PSA) is a rare congenital anomaly of the circulation of the lower limb that results from the persistence of an artery that normally regresses early in embryonic development. PSA is usually an incidental finding and is exceedingly rare to find bilaterally⁽¹⁾.

Case report - A 53 year old male presented in the surgery OPD with complains of pain and swelling in bilateral lower limbs & buttocks since. This pain aggravated on walking and was relieved on rest. The patient gave history of Diabetes Mellitus since 8 years. There was no history of tobacco consumption.

Clinical examination - This revealed oedema of bilateral feet. There were decreased clinically palpable dorsalis pedis pulsations bilaterally. Posterior tibial pulses were palpable normally. The motor and sensory function in the lower limbs were normal.

Cowie's sign i.e., diminished or absent femoral pulse in combination with a palpable popliteal pulse considered to be pathognomonic for a persistent sciatic artery was present.

Radiological examination -

1. The CT angiographic study of the lower abdominal aorta and both lower limbs reveal an anomalous course of bilateral internal iliac arteries seen coursing along sciatic notch, known as sciatic artery (Image 1), and forming the popliteal artery and anterior tibial/posterior tibial artery on either side (Image 2).
2. The external iliac, the superficial femoral and profunda femoris on either side appears small caliber vessels and superficial femoral runs a short course (Image 3).
3. All the arteries of both lower limbs reveal diffuse atherosclerotic changes in form of diffuse atherosclerotic calcification but there is no stenosis seen.



Image 1



(Image 2)



Image 3

DISCUSSION

Embryology - The umbilical arteries are the paired fourth set of ventral branches of the dorsal aorta⁽²⁾. After aortic fusion, they develop a secondary connection to the fifth lumbar intersegmental branches of the aorta, the region of the future aorto-iliac bifurcation⁽³⁾. As early as the 6-mm embryo stage, the primitive sciatic artery has already arisen from the umbilical artery to supply the developing lower limb bud. As development continues, it passes along the dorsal aspect of the growing skeletal mesenchyme running all the way to the sole of the foot. Segments of this embryonic artery are destined to persist as the popliteal and peroneal arteries⁽⁴⁾. This embryonic vascular supply is normally superseded and replaced by the development of the common and superficial femoral arteries.

The external iliac artery arises from the lateral aspect of the umbilical artery, just proximal to the origin of the sciatic artery. The site of the origin of the external iliac artery marks the subdivision of the umbilical artery into two parts, proximally the future adult common iliac artery, distally the internal iliac artery and its branches⁽⁴⁾.

By the 12-mm stage, the external iliac artery has further developed into the common and superficial femoral arteries. The latter at this stage extends distally toward the knee, but terminates above the knee in a bifurcation, the medial descending geniculate and, laterally, the superior communicating ramus, which later joins the sciatic artery. Meanwhile, in the thigh, the sciatic artery develops a sharp convexity toward the distal superficial femoral arterial branches, as if anticipating anastomosis⁽⁴⁾. The superior communicating branch of the femoral artery continues, to join the sciatic artery just above the knee in the region of the angular bend described. Thus, the distal axial vessel (popliteal and interosseous portions) is fed at this time by both sciatic and superficial femoral flow.

By the 18-mm stage, flow through the femoral artery via the superior communicating ramus into the popliteal artery has become predominant, so that the caliber of the superficial femoral artery is now much greater than that of the sciatic artery. By the 22-mm stage, the continuity of the sciatic artery has been completely interrupted, the femoral artery alone carrying blood to the branches beyond the knee. The proximal part of the sciatic artery eventually persists as the inferior gluteal artery⁽⁴⁾.

If the distal superficial femoral artery does not fully establish itself as the arterial inflow to the lower leg, persistence of the primitive sciatic artery may be the result. The cause of this occurrence, however, is not known. Its existence is not entirely dependent on failure to establish superficial femoral flow, since some autopsy cases reported have shown coexistence of the persistent sciatic artery with the superficial femoral artery, although the latter may be hypoplastic^(4,5,6,7,8).

Surgical Anatomy

The persistent sciatic artery is anatomically a continuation of the internal iliac artery. After giving rise to the superior gluteal and internal pudendal arteries in the pelvis, this ectatic vessel takes the path of the inferior gluteal artery and courses through the greater sciatic foramen below the piriformis muscle to enter the thigh, where it may accompany the posterior cutaneous nerve or lie within or adjacent to the sheath of the sciatic nerve. These structures are subject to compression by the aneurysmal vessel or to injury at the time of surgery. Running on the posterior aspect of the adductor magnus, inferior to the gluteus maximus, the sciatic artery passes into the popliteal fossa where it is continuous with the popliteal artery. Perforating vessels from the profunda may anastomose with the sciatic artery along its proximal course⁽⁹⁾.

Clinical Features

Patients with symptomatic PSA present at a mean age of 44 after an asymptomatic youth^(10,11). Presenting symptoms include buttock pain; pain and pallor of the lower extremity; claudication; poor capillary refill; cool extremities; black toes; and neurologic symptoms such as lower motor nerve weakness, sensory deficits, and pain in the sciatic nerve distribution^(10,12,13). On physical examination, Cowie sign—the absence of femoral pulse with the presence of distal pulses—is pathognomonic for PSA, although it is recognized in the minority of patients presenting with PSA⁽¹⁰⁾.

Treatment for patients with PSA depends on symptoms, the classification, and patient comorbidities. An asymptomatic PSA found incidentally does not require surgical treatment⁽¹²⁾. Oral anticoagulation that maintains an international normalized ratio between 2.5-3.5 and intravenous courses of prostaglandin E1 have been shown to improve claudication symptoms⁽¹⁴⁾.

CONCLUSION -

The PSA is a rare congenital vascular anomaly. Because of the

high incidence of associated pathology, a PSA should be included in the differential diagnosis of lower limb ischemia or suspected aneurysm formation. PSAs are of doubtful clinical significance when found incidentally at imaging; however, individual patient symptoms, unique arterial anatomy, and classification best determine the appropriate treatment options⁽¹⁾.

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