Bilateral sciatic artery persistence in a patient with infrarenal abdominal aortic aneurysm

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ABSTRACT

A persistent sciatic artery (PSA) is a rare congenital vascular anomaly, with an estimated prevalence ranging from 0.01% to 0.05%. This condition can cause ischemic events in the lower limbs and sciatic artery aneurysms but can also be asymptomatic. A PSA can complicate the treatment of other coexistent vascular diseases due to the thin caliber of the external iliac and femoral arteries. We report a case of a patient with bilateral PSAs and an infrarenal aortic aneurysm. The aneurysm was successfully treated by the endovascular approach. An ultra-low profile endograft associated with access incisions slightly above the usual position was used to overcome this challenging access. (J Vasc Surg Cases Innov Tech 2024;10:101509.)

Keywords: Congenital vascular anomaly; Aortic aneurysm; Persistent sciatic artery; Endograft

A persistent sciatic artery (PSA) is a rare congenital vascular anomaly, with an estimated prevalence ranging from 0.01% to 0.05%.[1] This condition can cause ischemic events in the lower limbs and sciatic artery aneurysms but can also be asymptomatic.[2-6] A PSA can complicate the treatment of other coexistent vascular diseases, such as an abdominal aortic aneurysm (AAA), due to the thin caliber of the external iliac and femoral arteries. We report a case of a patient with bilateral PSAs and an AAA. The AAA was successfully treated by endograft deployment using an ultra-low profile device. The patient provided written informed consent for the report of his case details and imaging studies.

CASE REPORT

A 64-year-old male patient was admitted with a palpable painless abdominal mass without any other accompanying symptoms. He had no intermittent claudication. At physical examination, he had absent femoral pulses bilaterally; however, the popliteal and pedal pulses were palpable in both limbs. A Doppler ultrasound scan showed an AAA with a diameter of 62 mm.

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For further investigation, the patient underwent a computed tomography angiogram (CTA; Figs 1 and 2), confirming the 62-mm AAA and demonstrating bilateral PSAs. In both limbs, the sciatic artery originated from the internal iliac artery and joined the popliteal artery in the distal thigh (P1 level). Both common femoral arteries were hypoplastic and ended in the proximal thigh. The external iliac and femoral arteries had a diameter of 6 mm on both sides.

The patient underwent endovascular abdominal aortic aneurysm repair (EVAR) using the ultra-low profile INCRAFT endograft (Cordis Corp). The main body had a proximal diameter of 26 mm and a 14F profile. The iliac components were 13 × 100 mm on the right and 16 × 100 mm on the left, both with 12F profiles. Access was achieved through bilateral transverse inguinotomy. Arteriotomies were done in the proximal common femoral arteries, close to the inguinal ligament. The access vessels had small diameters; thus, an ultra-low profile endograft was chosen.

The postoperative course was uneventful, and the patient was discharged within 48 hours. At his 30-day follow-up visit, he was asymptomatic and had no complaints. The follow-up CTA demonstrated adequate positioning of the endograft and no endoleak (Figs 3 and 4).

DISCUSSION

A PSA was first described by Green[7] in 1832. The sciatic artery originates from the internal iliac artery and is the main supply for the lower limbs in the early embryo. After 6 weeks, the femoral artery is formed from the external iliac artery and becomes the main blood supply.[1] A PSA is a rare vascular anomaly associated with a high incidence of stenosis, aneurysmal disease, and occlusion.[8,9]

Multiple PSA classifications have been reported. Bower et al defined PSA as complete if it is the primary blood supply system to the lower limb and incomplete when the femoral artery is the primary blood supply system to the popliteal artery. Types I and II represent complete

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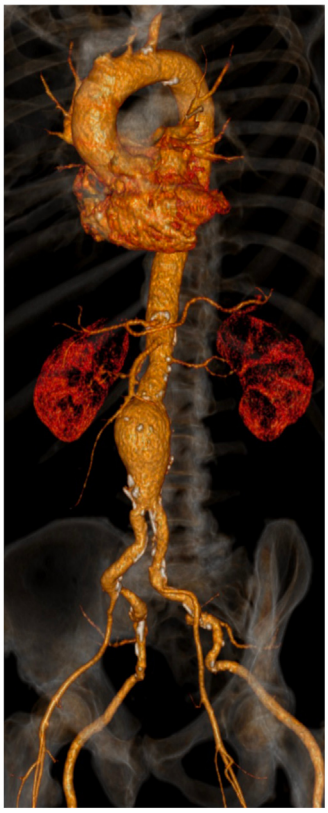

Fig 1. Three-dimensional reconstruction of computed tomography angiogram (CTA) showing bilateral persistent sciatic arteries (PSAs) associated with an abdominal aortic aneurysm (AAA): anterior view.

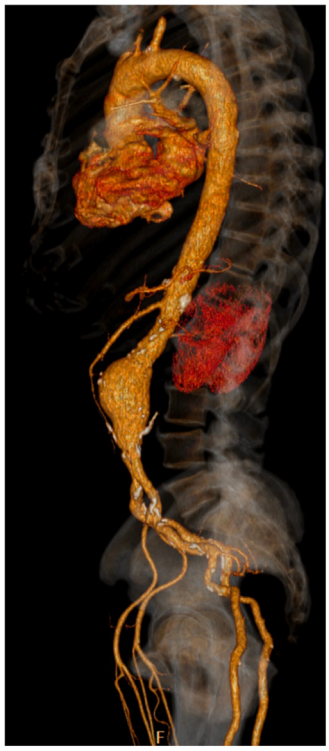

Fig 2. Three-dimensional reconstruction of computed tomography angiogram (CTA) showing bilateral persistent sciatic arteries (PSAs) associated with an abdominal aortic aneurysm (AAA): lateral view.

persistence, and types III and IV represent an incomplete PSA. Ahn et al[10] added type V, which originates from the median sacral artery. Lower limb ischemia is the most common complication of PSA.[11]

Aneurysmal disease in patients with a PSA presents more frequently as a sciatic artery aneurysm. It has been suggested that chronic trauma as a result of PSA compression against the sacrospinous ligament, piriform muscle, and hip, and frequent stretching during flexion of the hip joint, could be a cause of aneurysm formation.[12] A literature review found no case of an AAA in patients with bilateral PSAs. One case of a complex infrarenal abdominal aortoiliac aneurysm associated with a right aneurysmal PSA was reported.[13] In the present case, the physical examination raised the suspicion of a PSA. The finding of absent femoral pulses and present popliteal pulses suggested the anomaly.[14,15] However, the diagnosis was made by CTA, which was a part of the preoperative investigation for the AAA.

EVAR was a successful treatment option. Due to the small diameter of the femoral and external iliac arteries, an ultra-low profile endograft was used. The arteriotomies were done as proximally as possible in the common femoral arteries next to the inguinal ligament. No suprainguinal access was used, and there was no need to divide the inguinal ligament. The patient did not report any symptoms or signs of ischemia during follow-up.

The present patient had bilateral complete PSAs with hypoplastic femoral arteries (type 2a).[1] Despite their small diameters, these femoral vessels could be used as access for EVAR. The same can be used for PSA of types I, III, IV, and Va, which have developed femoral arteries. PSA types IIb and Vb have absent femoral arteries.[1] In these cases, suprainguinal access should be used for EVAR.

As stated, PSAs can result in aneurysms and lower limb ischemia.[12] In our patient, both PSAs had no signs of aneurysmal degeneration. Follow-up with a periodic CTA is mandatory to detect this evolution early. An annual CTA is a part of the EVAR follow-up protocol. Currently, the treatment options for PSA aneurysms are

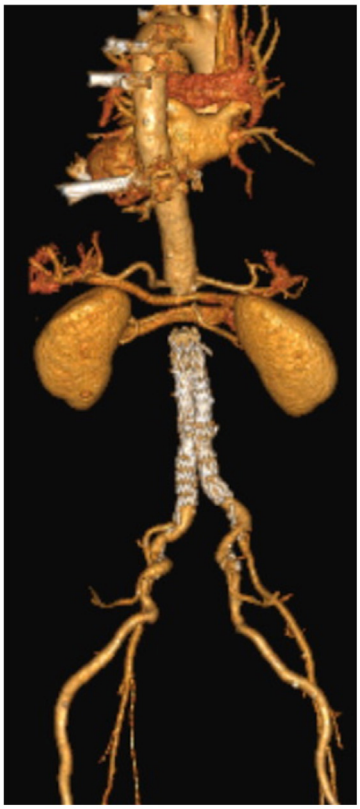

Fig 3. Three-dimensional reconstruction of computed tomography angiogram (CTA) showing adequate endovascular treatment of the abdominal aortic aneurysm (AAA) with an ultra-low profile endograft: anterior view.

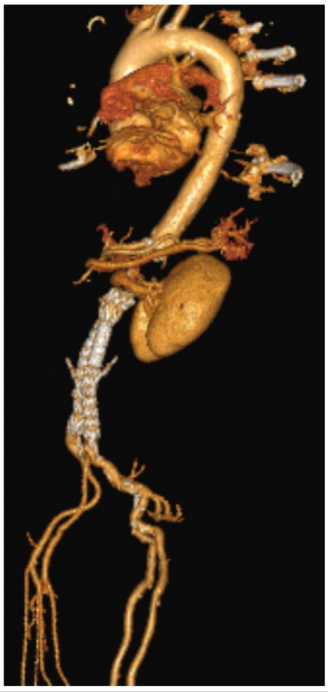

Fig 4. Three-dimensional reconstruction of computed tomography angiogram (CTA) showing adequate endovascular treatment of the abdominal aortic aneurysm (AAA) with an ultra-low profile endograft: lateral view.

open ligation and bypass, coil embolization, or endograft deployment.[12]

CONCLUSIONS

In a patient with bilateral PSAs and an infrarenal AAA, endovascular treatment of the aneurysm was safe and effective. An ultra-low profile endograft associated with access incisions slightly above the usual position was used to overcome this challenging access.

DISCLOSURES

None.

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