A Case of Sciatic Arterio-venous Malformation

Y. Umeda a,*, M. Imaizumi a, W. Okada b, H. Yokoya b, T. Tanaka a

a Department of Cardiovascular Surgery, Toyohashi Medical Center, Aichi, Japan
b Department of Cardiology, Toyohashi Medical Center, Aichi, Japan

Submitted 30 July 2011; accepted 21 August 2011

KEYWORDS
Persistent sciatic artery; Persistent sciatic vein; Arterio-venous malformation

Abstract A persistent sciatic artery is a rare congenital anomaly. On the other hand, a persistent sciatic vein is frequently associated with Klippel–Trenaunay syndrome. However, coexistence of both conditions is extremely rare. An 84-year-old woman was referred to our department for swelling of the unilateral lower extremity. Her internal iliac artery angiogram revealed persistence of both sciatic artery and dilated meandered sciatic vein. Furthermore, the sciatic artery connected with the dilated meandered sciatic vein directly through 'nidus' without a capillary connection. This is the first case of sciatic arterio-venous malformation.

Introduction Persistent sciatic artery (PSA) is a rare congenital vascular anomaly with a high incidence of aneurysmal formation and risk of rupture or thrombo-embolism.1,2 Previously, only two cases of co-existent sciatic vein with PSA were also reported.3,4 We present a case with PSA communicating with the sciatic vein (PSV) directly through 'nidus' without a capillary connection. This is the first case of sciatic arterio-venous malformation (AVM).

Report An 84-year-old woman was referred to our department for slight swelling of the entire left lower extremity for about 1 month and a positive D-dimer (16.43 μg ml⁻¹). A venous duplex scan and contrast-media-enhanced computed tomography (CT) were performed to rule out deep venous thrombosis; however, no thrombus was detected. Incidentally, contrast-media-enhanced CT revealed the PSA and vein running dorsal to the ischium and a dilated vascular lesion (30 × 35 mm) dorsal to the neck of the left femur.

Later, a venous duplex scan was performed again. Colour Doppler ultrasonography showed a dilated vascular lesion with partition structure. Some vessels with arterial signal flowed into the dilated vascular lesion, and some vessels with continuous venous signal drained from the dilated vascular lesion were also revealed (Fig. 1). Then, we suspected sciatic AVM, and the iliac artery angiography was scheduled to confirm the diagnosis.
On physical examination, there was no pulsate mass but bruit was audible at the left side bottom of the hip. The left femoral pulse was palpable equally to the right femoral pulse. All other pulses were normal, and ankle brachial pressure indices were 1.0 bilaterally. Swelling of the left lower extremity was not significant at the time of admission.

Angiogram of the internal iliac artery showed that the sciatic artery did not communicate with the popliteal artery (i.e., an incomplete patent sciatic artery). The sciatic artery flowed into the highly ectatic blood vessel (nidus), and the dilated meandered sciatic vein flowed out from the nidus without a capillary connection (Fig. 2). Angiogram of the left external iliac artery showed that the left external iliac artery continued to the femoral artery communicating with the popliteal artery. A small branch of the left deep femoral artery flowed into the nidus.

Ascending venography showed normal venous continuity of the saphenous/popliteal-femoral-iliac vein.

The femoral vein flow was obstructed by compression to clarify the connection between the sciatic vein and the femoral vein at the time of the internal iliac artery angiography and the ascending venography. In the internal iliac artery angiography, obstruction of the femoral vein did not influence the drainage flow of the sciatic vein. On the other hand, in ascending venography, compression of the femoral vein resulted in the obstruction of femoral vein flow, and no drainage flow through the sciatic vein was detected.

Embolisation of the sciatic artery and the branch of the left deep femoral artery using coil was performed. The patient was discharged 2 days after embolisation without any complications.

Discussion

The occurrence of PSA is unusual but can be revealed angiographically in 0.01–0.06% of patients. In spite of the well-known development steps of the sciatic artery, the mechanism of persistence of the sciatic artery is unclear. On the other hand, the venous development of the lower extremities is less well described. A peripheral border vein serves as an early drainage channel recognised a few weeks after the development of sciatic artery. The sciatic vein withers with the sciatic artery regressing, and it is also rare that the sciatic vein is recognised in adults.

Co-existence of the persistent sciatic vein (PSV) with PSA was described in only two papers. However, even in those papers, PSA and PSV had no direct connection as seen in the present case. In our case, angiogram showed that PSA connected with PSV directly through ‘nidus’ without a capillary connection. Colour Doppler ultrasonography also showed a dilated vascular lesion, and some vessels with arterial signal flowed into it and some vessels with...
continuous venous signal drained from it. Thus, we diagnosed as sciatic AVM. AVM is defined as anomaly of direct anastomosis between artery and vein without a capillary connection. The precise mechanism of AVM formation has not been clarified. However, conversely, the possibility that the AVM formation between the sciatic artery and the sciatic vein in the early embryo stage affected the persistence is suggested, because PSA seen in the present case was incomplete PSA, and PSV had no communications with the popliteal or saphenous vein.

In conclusion, we believe this case shows that persistence of the sciatic artery and vein may occur synchronously accompanying with AVM.

Conflict of Interest

None.

Funding

None.

Appendix

Supplementary material

Supplementary data related to this article can be found online at doi:10.1016/j.ejvsextra.2011.08.002.

References