A case of persistent sciatic artery encountered during cerebral aneurysm embolization

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Abstract
The femoral artery is usually the main route of access in many endovascular procedures and diagnostic angiograms. A rare anomaly of persistent sciatic artery (PSA) was encountered during embolization of unruptured cerebral aneurysm. This report is to describe the clinical features and the embryological considerations of the PSA that interventionists should be aware of.

Key words
persistent sciatic artery, anatomy, anomaly

Case report
A 46-year-old woman with an unruptured aneurysm of the paraclinoid portion of the right internal carotid artery underwent coil embolization in our institute. A diagnostic angiogram was performed 2 months prior to the procedure. Several punctures of the right femoral artery were required at the time of diagnosis. The pulsation of the femoral artery was noticed to be very weak on both sides.

A 6 French introducer was inserted into the right femoral artery for the embolization procedure. Coiling of the aneurysm was performed. Heparin was administered during the procedure as a prophylactic protocol. At the end of the procedure, prior to the use of hemostatic device, we did an angiogram of the right femoral artery to check the caliber and the site of entrance of the introducer into the artery. The femoral artery was found to be of small caliber.

Another vessel, more prominent in its diameter, arose from the internal iliac artery and coursed lateral to the femoral artery towards the distal part of the limb, was observed (Fig. 1). The caliber of the femoral artery was considered too small to use a hemostatic device. Manual compression was done to achieve hemostasis in the groin.

Further investigation of this anomalous artery was performed by contrast enhanced CT scans. The anomalous vessel was found bilaterally and the final diagnosis of this artery was the persistent sciatic artery (PSA) by its course.

Discussion
The PSA is a very rare anomaly observed only in 0.03% to 0.06% and bilateral presentation is reported to be 30%.1 The usual presentation is aneurysmal formation, ischemic symptoms, or pain.1–4 It can be recognized as an artery arising from an enlarged internal iliac artery passing through the greater sciatic foramen below the piriformis muscle to enter the thigh area. The vessel later on passes into the popliteal fossa to join the popliteal artery.

Embryologically, the vessel is the remnant of the umbilical artery branch supplying the lower limb bud at the 6-mm embryo stage. At this stage, it runs to the extremity of the limb bud. The external iliac artery, on the other hand, arising from the lateral aspect of the umbilical artery develops further into the common and superficial femoral arteries by the 12-mm stage. By the 18-mm stage
the superficial femoral artery takes over the supply to the popliteal artery and the sciatic artery regresses to become the inferior gluteal artery resulting in the femoral artery alone supplying blood to the branches beyond the knee.\(^4\)

Depending on the degree of the anastomosis to the femoral artery system, the PSA can be in complete or incomplete form.

Although the PSA is a rare anomaly, an interventionist should be aware of its existence. The usual clinical finding is weak pulsation of the femoral artery compared to that of the popliteal artery. Difficulties in the puncture of the femoral artery with combination of the above finding should raise suspicion of the PSA. Diagnostic imaging is quite classic. The course of the PSA can be easily recognized on conventional angiography and also by other less invasive methods such as CT and MRI. In cases of PSA, the internal iliac artery is enlarged and this anomalous vessel runs lateral to the femoral artery in anteroposterior view. On axial images the vessel runs posterior to the femoral artery system. The femoral artery is usually hypoplastic in the settings of PSA (Figs. 2, 3).

The PSA is an important anomaly to keep in mind during the access of the femoral artery apart from other conditions that might cause weakness in the pulse of the femoral artery such as atherosclerotic conditions, fibromuscular dysplasia, coarctation of aorta, and aortitis syndrome. We believe that the approach need not necessarily be modified as long as the caliber of the femoral artery is considered large enough for the endovascular approach. In case of unilateral PSA, contralateral femoral artery approach maybe the first alternative before considering other approaches such as the brachial approach. There is
Fig. 2
Maximum intensity projection image of CT done after the procedure. The persistent sciatic artery can be identified bilaterally (arrows). Both femoral arteries are hypoplastic (arrowheads). Note the posterior path of the persistent sciatic artery to the bone.

Fig. 3
Three-dimensional reconstruction of contrast-enhanced CT showing the course of the persistent sciatic artery (arrowheads). It travels through the greater sciatic foramen thus having the same path as the inferior gluteal artery.
no long-term follow-up report for asymptomatic PSA. We recommend that the patient be advised to avoid chronic trauma to the gluteal region such as sitting on hard surface. Periodic evaluation with non-invasive imaging is also an option. Educating the patient about PSA and its possible symptoms would help if problems occur in future.

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References