

Arteriovenous Malformation of the Left Lower Limb

By M.S. Carlos, RT; D.G. Silva, BS; P. Bertolazzi, BS; A.L. Bonomo, MD
Radiology Department, Clinica Salles, Sao Mateus, Espirito Santo, Brazil

History

A 67-year-old male patient, suffering from long-term pain in his left lower limb, presented himself to the hospital for a checkup. The pain commonly occurred after walking or an extended period in orthostasis. There was no associated local swelling. His medical history was unremarkable except for a long-term well-controlled hypertension. A Runoff CT angiography (CTA) was requested for evaluation.

Diagnosis

CTA images showed a dilated left femoral artery and vein, which along with the also dilated popliteal artery and vein, extended into a tangled and tortuous vascular mesh with a nidus. The anomalous vessels were accentuated posteriorly and distributed between the muscle bellies, with no signs of intra-articular or intraosseous extensions. Arteriovenous communications were evidenced, suggesting an arteriovenous malformation (AVM).

The patient underwent a vascular embolization and was in good general condition with improved symptomatic in the follow-up.

Comments

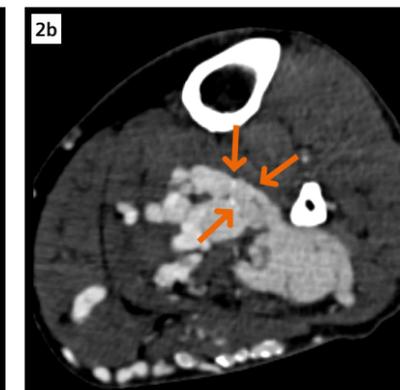
AVMs are vascular malformations composed of arteries and veins that directly communicate through a central nidus, bypassing the high resistance of capillary beds and leading to a high-flow lesion that shunts blood from arterial to venous circulation. Embolization alone, or in conjunction

with surgical resection, is the primary treatment option for AVMs. Imaging evaluation is vital to the characterization and subsequent treatment planning. A Runoff CTA allows vascular assessment of the entire lower extremities, including the AVM and its relationship to the specific muscles and bones, in a single scan. In this case, image reconstruction of orthogonal planes, additionally to axial thin slices, was possible with the *syngo.via* platform, enabling detailed and fast vessel evaluation. Three-dimensional life-like image demonstration using cinematic volume rendering technique (cVRT) provides improved depth and shape perceptions. ●



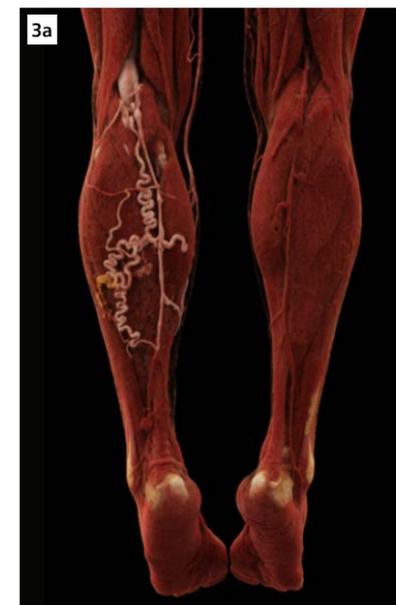
1 A cVRT image shows a vascular overview of the entire lower extremities in the arterial phase. The dilated left femoral artery and vein, as well as the popliteal artery and vein, extend into a tangled and tortuous vascular mesh with a nidus.

The outcomes by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.



2 Oblique MPR images show arteriovenous communications (arrows) evidencing an AVM.

3 cVRT images, displayed in different presets, show the posterior view of the AVM in detail.



Examination Protocol

Scanner	SOMATOM go.Now		
Scan area	Lower Extremities	Pitch	1.4
Scan mode	Spiral	Slice collimation	16 × 0.7 mm
Scan length	115 cm	Slice width	1.5 mm
Scan direction	Cranio-caudal	Reconstruction increment	1.0 mm
Scan time	58 s	Reconstruction kernel	Br40
Effective mAs	38 mAs	Contrast	300 mg/mL
Dose modulation	CARE Dose4D	Volume	60 mL + 40 mL + 30 mL
CTDI _{vol}	3,11 mGy	Flow rate	4.0 mL/s + 2.8 mL/s + 3.0 mL/s
DLP	364 mGy cm	Start delay	Bolus Tracking with 100 HU in the abdominal aorta at the renal level + 10 s
Rotation time	0.8 s		