Giant Arteriovenous Malformation of the Anterior Abdominal Wall

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History

A 20-year-old male patient, suffering from a painless, progressive, pulsatile swelling in the left paramidline anterior abdomen for the past 10 years, was presented to the hospital. A vascular malformation was suspected and a CT angiography (CTA) was ordered to assess the vascular supply and the extent of the lesion prior to surgical resection.

Diagnosis

CTA images revealed a left paramidline soft tissue mass, measuring 8 × 15 × 18 cm in size, in the left rectus abdominis with gross vascularity suggestive of an arteriovenous malformation (AVM). Arterial feeders were visible, superiorly from the prominent left internal mammary artery via the left superior epigastric artery and inferiorly through the left inferior epigastric artery originating from the left external iliac artery. No signs of a major draining vein or an arterial-venous (A-V) shunt could be identified in either arterial or venous phase. The histological result derived from an operative resection confirmed the diagnosis of an AVM.

Comments

An AVM is a disorder in which the blood shunts directly from the arteries to the veins, bypassing the capillaries. The channels between the artery and

1 Right (Fig. 1a) and left (Fig. 1b) oblique views of cinematic rendering images, acquired in the arterial phase, depict an AVM of the anterior abdominal wall along with its arterial feeders, superiorly from the prominent left internal mammary artery via the left superior epigastric artery and inferiorly through the left inferior epigastric artery originating from the left external iliac artery.

vein are termed the "nidus". The nidus can consist of a smaller number of large arteriovenous shunts, which was not seen here, or a vast number of tiny shunts, which can only be confirmed by histopathology at the microscopic level, such as in this case. Although MRI and ultrasound are preferable for acquiring hemodynamic information, CTA is widely available and accessible to provide the necessary information concerning vascular anatomy, enhancement, thrombosis, calcification, and involvement of adjacent structures. With the development of advanced technologies, significant reductions in radiation dose and contrast agent have been made possible, which promote the applications of CTA in clinical routine. In this case, a 100 kV setting was applied, combined with CARE Dose4D™ (Real-time Anatomic Exposure Control), to achieve a complete acquisition of the trunk at a $CTDI_{vol}$ of only 3.3 mGy. Three-dimensional images aid the physicians for clear communication and demonstration.

Examination Protocol

Scanner	SOMATOM Definition Flash				
Scan area	Thorax – Abdomen	**Dose modulation**	CARE Dose4D™	**Slice width**	0.75 mm
Scan mode	Spiral	**$CTDI_{vol}$**	3.31 mGy	**Reconstruction increment**	0.5 mm
Scan length	567.5 mm	**DLP**	211 mGy cm	**Reconstruction kernel**	B26f
Scan direction	Cranio-caudal	**Effective dose**	3.2 mSv	**Contrast**	350 mg/mL
Scan time	6.2 s	**Rotation time**	0.5 s	**Volume**	70 mL+ 20 mL saline
Tube voltage	100 kV	**Pitch**	1.2	**Flow rate**	3.5 mL/s
Effective mAs	80 mAs	**Slice collimation**	128 × 0.6 mm	**Start delay**	Bolus tracking + 5s

2 Right oblique view of a cinematic rendering image (Fig. 2a) and a sagittal MPR image (Fig. 2b), acquired in the venous phase, show a soft tissue mass with gross vascularity in the anterior abdominal wall without the presence of major A-V shunts or draining veins.

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