Renal Artery Aneurysm

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History

A 69-year-old female patient suffering from nausea and weight loss of 5 kg within the past 2 months was referred for a CT examination. TwinBeam Dual Energy (TBDE) CT was performed to rule out any abdominal disorders.

Diagnosis

CT images showed a saccular, wide-necked, contrast-filled outpouching arising from the bifurcation of the right renal artery, suggesting an extra-parenchymal aneurysm. The maximum diameter was 2.8 cm. Kidney perfusion and excretion appeared to be symmetrical. Calcified plaques were seen at the origin of the celiac artery and of the left renal artery as well as in the abdominal aorta and bilateral iliac arteries, all causing no significant stenosis.

Comments

A renal artery aneurysm (RAA) is defined as a dilated segment of the renal artery that exceeds twice the diameter of a normal renal artery.[1] It is usually asymptomatic but can be complicated by conditions such as rupture, thrombosis, distal embolism, obstructive uropathy, hypertension of renovascular etiology, and arterio-venous communications.[2] Treatment of an RAA depends upon the size and location of the aneurysm, and also whether it is symptomatic or not. Prior to surgical repair or endovascular interventions, CT or MR examinations are usually required to evaluate the exact location, size, and structure of the aneurysm as well as its relation to the nearby organs. Increasingly higher speed and improved spatial resolution make CT a first-line imaging modality. Three-dimensional image reconstructions demonstrate the aneurysm in an illustrative way and provide us with its detailed anatomy. This is of particular value when planning surgery. In this case, an innovative Dual Energy approach, TBDE, was performed. It allows simultaneous acquisition of high and low kV datasets in a single scan. The datasets are processed in *syngo*.CT DE Direct Angio, which accurately highlights bone structures and removes them in an automated workflow. ●

References

[1] Coleman DM, Stanley JC. Renal artery aneurysms. J Vasc Surg. 2015 Sep. 62 (3):779-85.

[2] I. Anastasiou, I. Katafigiotis, C. Pournaras, E. Fragkiadis, I. Leotsakos, and D. Mitropoulos, "A cough deteriorating gross hematuria: a clinical sign of a forthcoming life-threatening rupture of an intraparenchymal aneurysm of renal artery (Wunderlich's Syndrome)," Case Reports in Vascular Medicine, vol. 2013, Article ID 452317, 3 pages, 2013

1 Cinematic rendering images show a saccular aneurysm arising from the bifurcation of the right renal artery.

2 Cinematic rendering images, using different presets, show the anterior (Figs. 2a and 2b) and posterior (Figs. 2c and 2d) views of the abdominal aorta and its branches, before (Fig. 2a) and after (Figs. 2b–2d) bone removal using *syngo*.CT DE Direct Angio. Kidney perfusion appears symmetrical.

Examination Protocol

Scanner	SOMATOM Definition Edge				
Scan area	Abdomen	**Dose modulation**	CARE Dose4D™	**Slice width**	0.75 mm
Scan mode	TwinBeam Dual Energy	**CTDI$_{vol}$**	7.83 mGy	**Reconstruction increment**	0.5 mm
Scan length	406 mm	**DLP**	332 mGy cm	**Reconstruction kernel**	Q30f
Scan direction	Caudo-cranial	**Effective dose**	4.98 mSv	**Contrast**	400 mg/mL
Scan time	7.7 s	**Rotation time**	0.33 s	**Volume**	120 mL + 40 mL saline
Tube voltage	AuSn 120 kV	**Pitch**	0.45	**Flow rate**	4 mL/s
Effective mAs	365 mAs	**Slice collimation**	64 × 0.6 mm	**Start delay**	Bolus tracking