An Incidental Renal Mass

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History

A 75-year-old male patient with recent unexplained bowel obstruction was sent for a follow-up CT enterography. TwinBeam Dual Energy (TBDE) CT was performed.

Diagnosis

TBDE images showed a left renal soft tissue lesion, measuring 1.8 × 2.1 × 2.1 cm in size, with contrast enhancement compatible with a renal neoplasm. This was later confirmed by PET. There was no evidence of bowel obstruction or the presence of any obstructing lesions. The patient subsequently underwent partial nephrectomy for this unsuspected lesion. Pathology revealed a clear cell renal carcinoma.

Comments

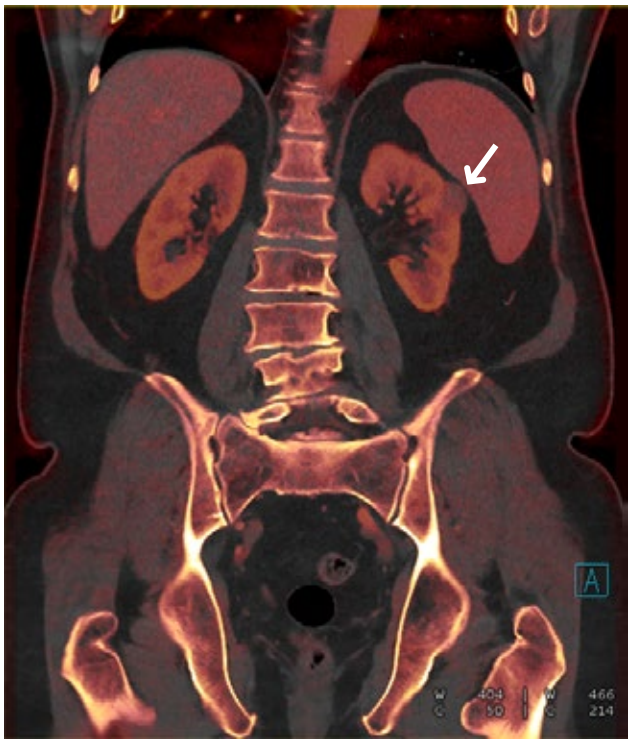
This is a common scenario, in which a finding is observed that would require further testing to characterize for treatment decision. TBDE CT is ideally suited for these patients, allowing simultaneous acquisition of high and low kV datasets in a single scan. The dataset can then be processed in *syngo*.CT DE Virtual Unenhanced to create either a virtual noncontrast (VNC) (Fig. 1d) image or an iodine map (Figs. 1a, 1c and 2) for presenting and quantifying the iodine uptake, which is more useful in clinical practice. In this case, the unsuspected renal mass enhanced 38 HU (CM) from 45.9 HU (VNC) to 83.7 HU (mixed). This change in HU would be close to what might be observed if a "traditional" noncontrast CT acquisition were to be compared to a contrast-enhanced acquisition. This approach could eliminate the need for a noncontrast scan. The value of not having to recall the patient for another exam and avoidance of additional exposure is obvious.

Examination Protocol

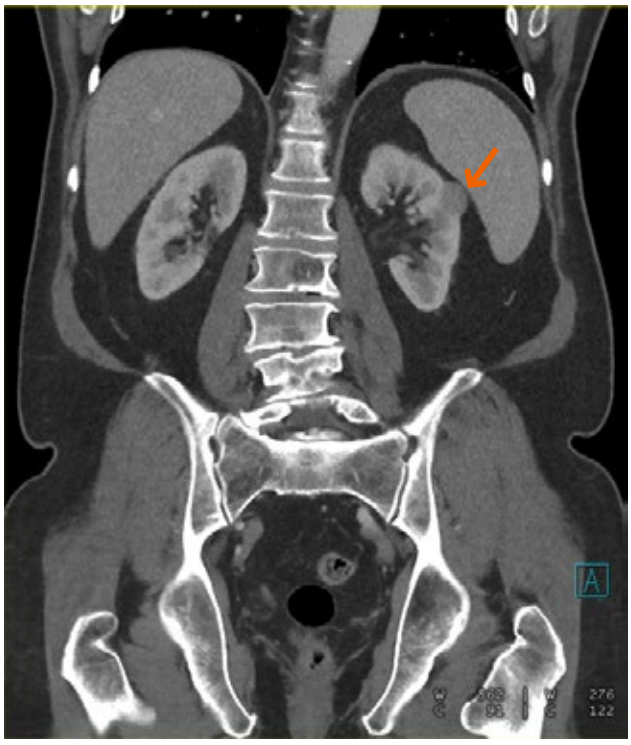
Scanner	SOMATOM Definition Edge		
Scan area	Abdomen	**Rotation time**	0.33 s
Scan mode	TwinBeam Dual Energy	**Pitch**	0.3
Scan length	446 mm	**Slice collimation**	64 × 0.6 mm
Scan direction	Caudo-cranial	**Slice width**	0.75 mm
Scan time	12.6 s	**Reconstruction increment**	0.5 mm
Tube voltage	AuSn120 kV	**Reconstruction kernel**	Q40f
Effective mAs	381 mAs	**Contrast**	300 mg/mL
Dose modulation	CARE Dose4D™	**Volume**	124 mL
$CTDI_{vol}$	8.16 mGy	**Flow rate**	2.5 mL/s
DLP	387.2 mGy cm	**Start delay**	60 s
Effective dose	5.81 mSv		

The outcomes by Siemens' 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.

1a



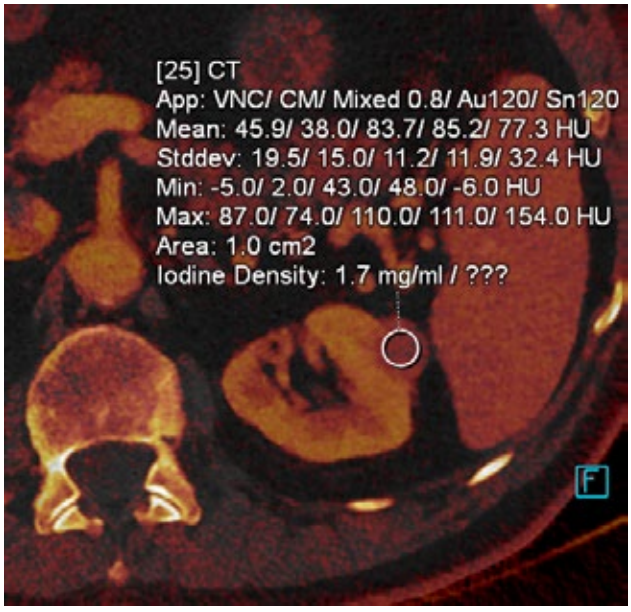
1b



1c

1d

2



1 Coronal views of an iodine/mixed fused image (Figs. 1a, and 1c, different window settings) and a mixed image (Fig. 1b) show an enhanced left renal lesion (arrows) which was isodense in a VNC image (Fig. 1d, arrow). The enhancement is much easier to depict in the iodine/mixed fused images.

2 Quantitative measurements show a significant enhancement of 38 HU in the left renal lesion, with an iodine uptake of 1.7 mg/mL.