

Both Morphological and Functional Assessments of Congenital Urinary Tract Abnormality using 3D Sequences

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Patient history

26-year-old woman with right lumbar pain. **Sonography:** Right located horse-shoe kidney. **Scintigraphy:** No left kidney and normal right kidney.

MRI protocol

Images were acquired after IV furosemide diuretic stimulation on a MAGNETOM Symphony, A Tim System.

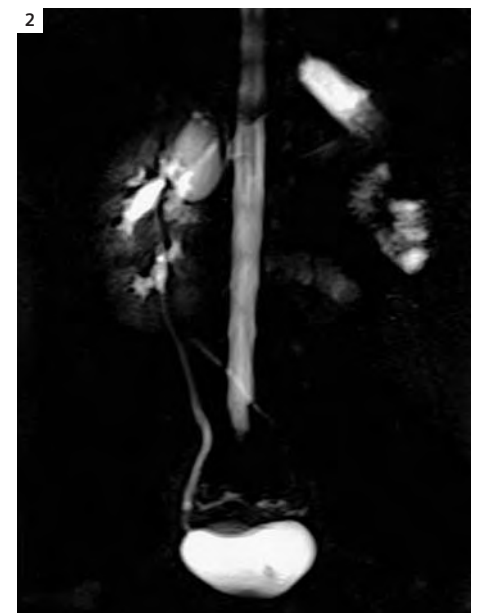
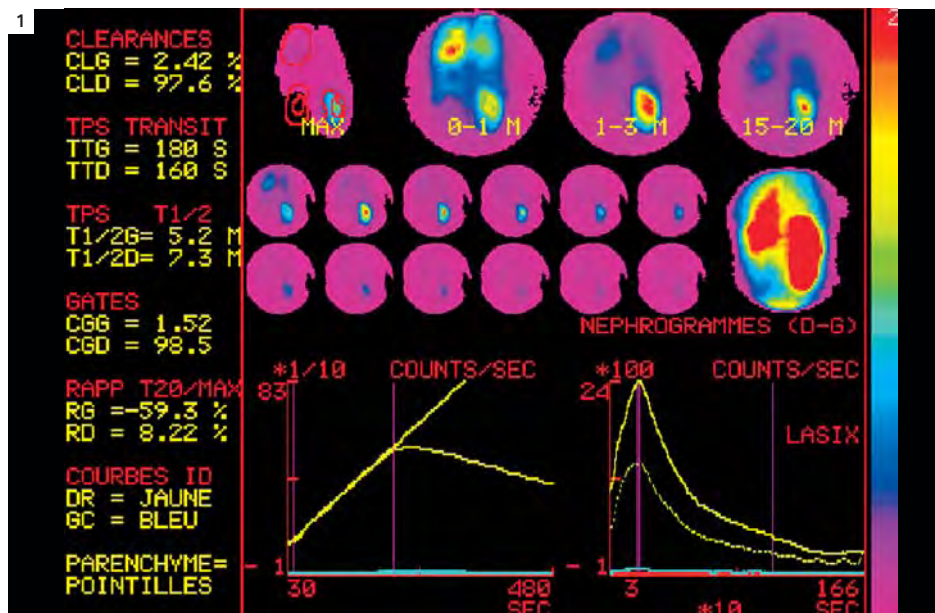
Morphological evaluation was based on both source and MIP (maximum intensity projection) images which were generated from:

- a) Respiratory-triggered (PACE) heavily T2-weighted SPACE pulse sequence (TR/TE/ETL: 1800/678/129, 40 slices, voxel size: 1.5 mm³) (Fig. 2).
- b) The first acquisition (arterial time) and the latest acquisitions of a 10 s dynamic contrast-enhanced T1-weighted 3D-FLASH pulse sequence (TR/TE/ : 3.6/1.5/60°, 32 slices, voxel size: 2.5 mm³, acquisition protocol: every 15 s during 5 min, every 30 s during the following 3 min, and every minutes until 20 min after contrast IV bolus (0.2 mmol/kg, 2.5 ml/sec). The linearity of signal intensity versus contrast agent concentration (ranging

from 0 to 4.5 mmol/l) was previously asserted by test-object (R = 0.995) (Fig. 3). Functional analysis was based on time-intensity curves generated from regions of interest (ROIs) drawn over the aorta, the long axis parenchyma (Figs. 4A, B), and the collecting system (Figs. 5A, B). Cortical intake, transit time were computed and urinary excretion was evaluated.

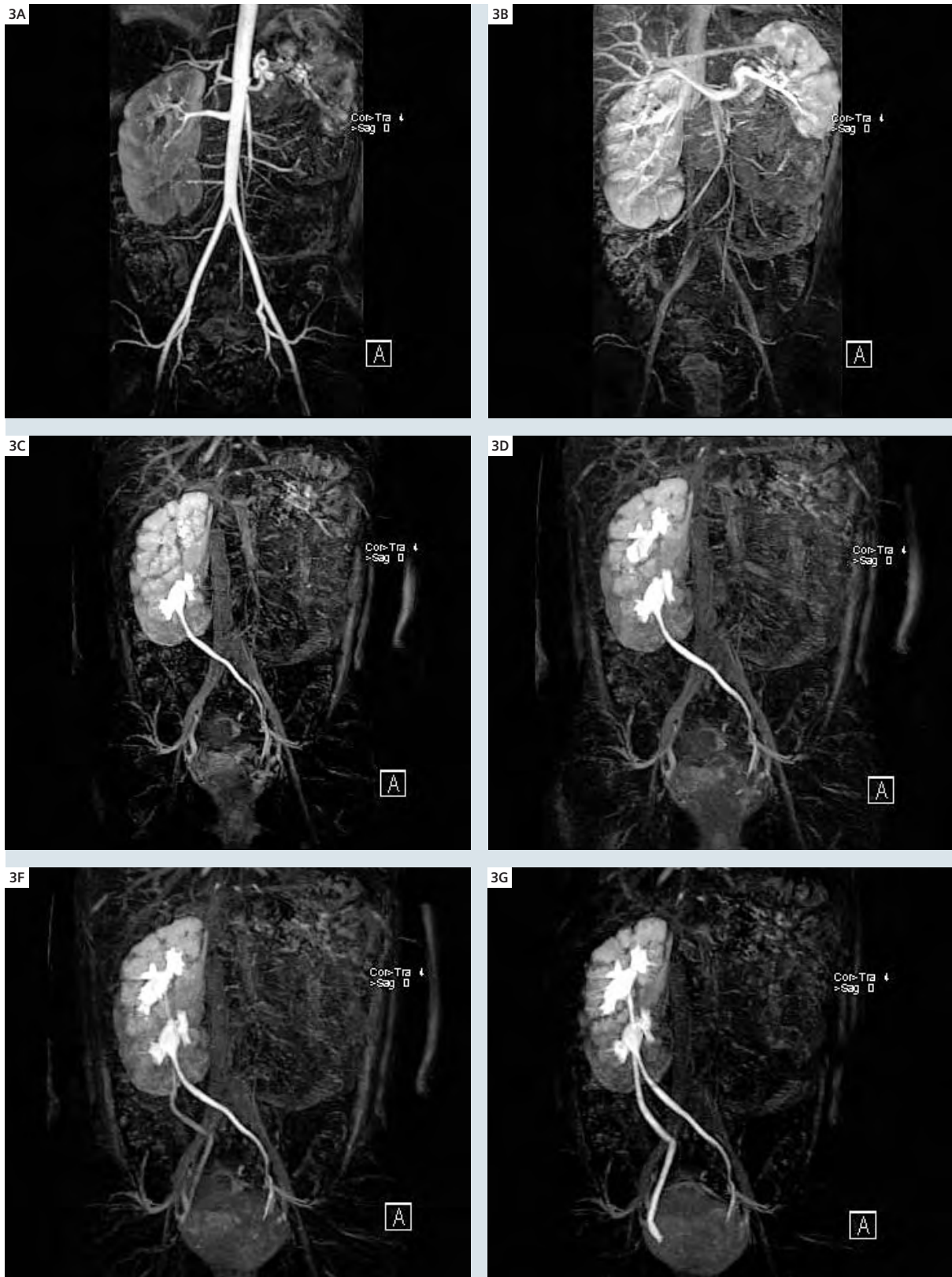
Conclusion

This MR procedure provides an accurate all-in-one assessment of the urinary tract. Accordingly, MR is a technique of choice especially when considering laparoscopic surgery.

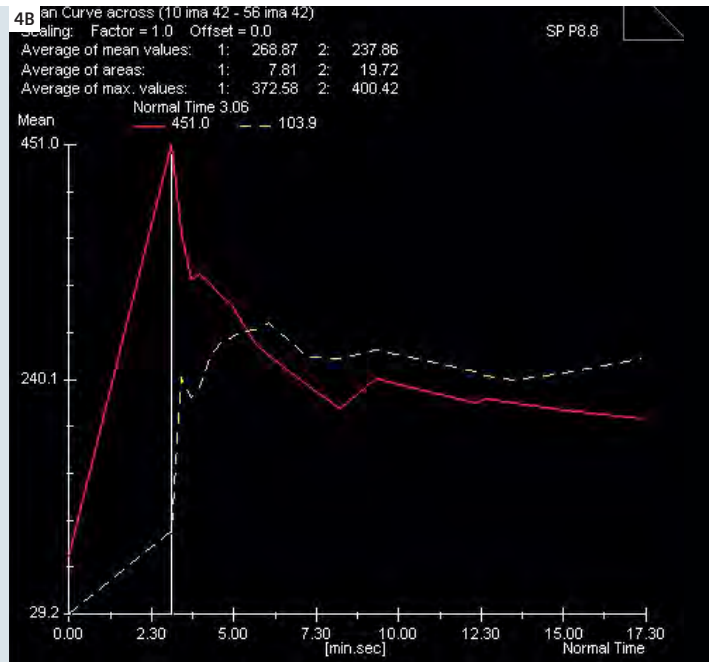
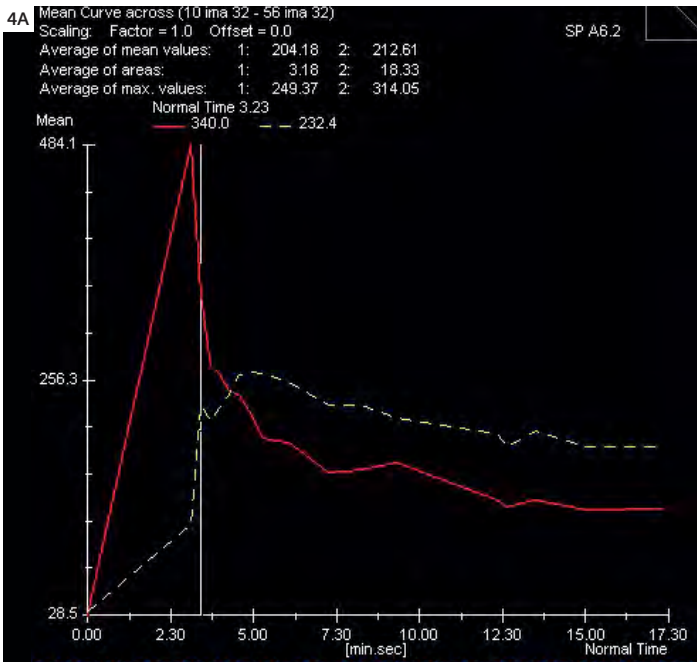


1 Scintigraphy showed no left kidney and normal right kidney.

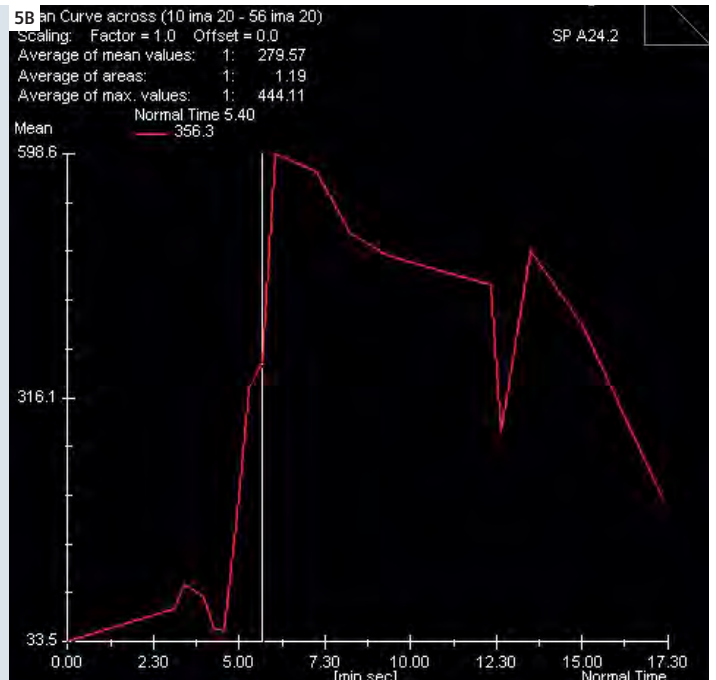
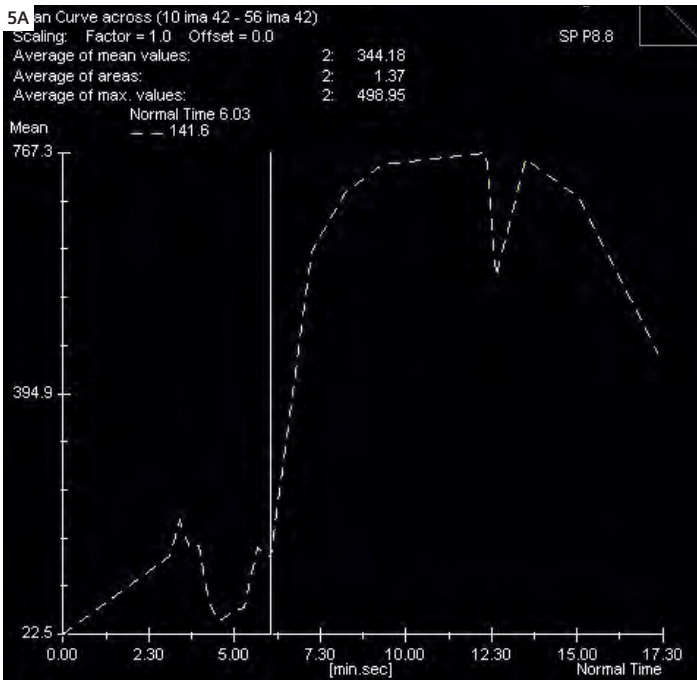
2 On this RARE image, crossed renal ectopia is suspected but left renal ureter is not very well delineated.



3 MIPs generated from the dynamic sequences. On the first arterial MIP, an inferior accessory renal artery is depicted and the crossed renal ectopia is nicely delineated.



4 Time/Intensity curves of the upper (A) and lower (B) parts of the renal parenchyma (yellow) compared to the aorta (red). Cortical intakes are similar.



5 Compared Time/Intensity curves of the upper and lower collecting system, also similar.

* WIP – Works in progress. This information about this product is preliminary. The product is under development and not commercially available in the U.S., and its future availability cannot be ensured.

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