Incidental Findings on Renal MRA

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Introduction: Renal MRA is one of the most commonly performed examinations in most body MRI practices. A number of different protocols are employed, but nearly all include 3D contrast-enhanced MRA as the primary technique. One aspect of renal MRA protocols where there is wide variability involves the amount of additional imaging performed before and after 3D CE MRA. Many practices simply perform scout sequences followed by 3D CE MRA, with the goal of rapid throughput and efficiency. Other practices include additional sequences before and after contrast administration in order to characterize incidental renal and adrenal lesions. This paper examines incidental findings noted in 113 consecutive renal MRA examinations performed at our institution.

Methods: Reports from 113 consecutive renal MRA examinations performed over a 2 month period were examined. All examinations were requested with indications of either hypertension or renal insufficiency; renal MRA's requested in patients with known renal cell carcinoma were excluded. Patient age and sex were noted, as well as the results of renal MRA. Incidental findings were characterized as vascular or nonvascular, and were tabulated for each report.

Results: 113 renal MRA's consisted of 58 male and 55 female patients with average age 65 years (range 32-90). 43 examinations (38%) were negative (no renal artery stenosis or mild narrowing not considered hemodynamically significant). 70 examinations (62%) demonstrated moderate-severe stenosis (> 50%) in one or more renal arteries.
Incidental vascular findings: 26 patients had severe stenosis or occlusion of one or more mesenteric arteries. 8 patients had abdominal aortic aneurysms greater than 4 cm diameter. 2 patients had an aortic dissection and 1 patient had a focal dissection of the celiac artery. 13 patients had severe aortic atherosclerosis with ulcerating plaques. 1 patient had thickening and enhancement of the aortic wall suggesting vasculitis or retroperitoneal fibrosis.
Incidental non-vascular findings: 63 patients had renal or hepatic cysts. 11 patients had adrenal adenomas. 14 patients had significant renal atrophy. 10 patients had cholelithiasis. 5 patients had hepatic hemangiomas. 3 patients had significant biliary dilatation: etiologies included choledocholithiasis, intraductal pancreatic mucinous tumor, and pancreas divisum. 3 patients had significant pleural effusions. 1 patient had an incidental 3 cm renal cell carcinoma (Fig. 1). 1 patient had splenomegaly and extensive mesenteric adenopathy consistent with lymphoma (Fig. 2). 1 patient had a solitary mesenteric mass of uncertain etiology.

Conclusions: Incidental vascular and nonvascular findings in renal MRA are common. While most vascular findings are adequately characterized on 3D CE renal MRA, nonvascular findings often require additional sequences for visualization and characterization. This is important not only to identify significant lesions, but also to characterize benign lesions and thereby avoid the expense of additional imaging. In-phase/out-of-phase sequences, for example, allow characterization of incidental adrenal masses without follow-up CT or MRI. Post-contrast 2D or 3D SPGR sequences help to identify and characterize parenchymal masses. The addition of 2 or 3 sequences to a standard renal MRA protocol allows detection and characterization of most incidental abdominal lesions at a relatively small cost in imaging time.

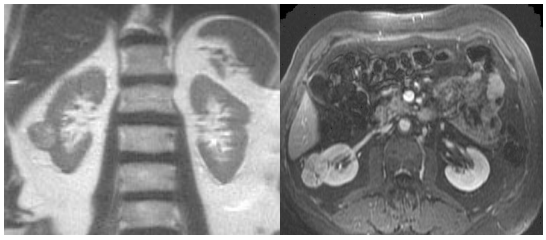

Fig. 1. Coronal single shot fast spin echo image (left) and axial post-contrast 3D SPGR image (right) reveal an incidental renal cell carcinoma in the right kidney.

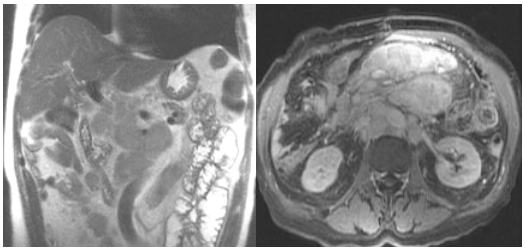

Fig. 2. Coronal single shot fast spin echo image (left) and post-contrast axial 2D SPGR image (right) reveal extensive mesenteric and retroperitoneal adenopathy in a patient with lymphoma.