

# Harvard Medical School Department of Continuing Education and the Renal Division of Brigham and Women's Hospital



***Nephrology Rounds***  
**April 2006**

## **Renal Artery Stenosis**

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### **Objectives**

Renal artery stenosis (RAS) is one of the more common forms of secondary hypertension, estimated to account for 1% to 5% of the hypertensive population. RAS is easy to diagnose by modern imaging techniques, including magnetic resonance angiography (MRA), and relatively easy to correct with angioplasty and stenting, which is technically successful >90% of the time in improving renal perfusion. However, there is a significant complication rate and whether revascularization improves outcomes for most patients with RAS is unknown. The following questions address the diagnosis and management of patients with anatomic RAS, hypertension, and renal disease.

### **Questions:**

1. What would be the most appropriate first test to screen for RAS in a 75-year-old man with coronary artery disease, peripheral vascular disease, difficult-to-control hypertension, a creatinine of 2.5, and asymmetric kidney sizes?
  - a. Computed tomography (CT) angiography
  - b. Conventional angiography
  - c. MR angiography
  - d. Renal vein renin levels
2. Which class of antihypertensive drugs must be stopped prior to performing a post-captopril renal scan?
  - a. ACE inhibitor
  - b. Beta-blocker
  - c. Angiotensin-receptor antagonist
  - d. Diuretic
  - e. All of the above
3. Potential indications for intervention in RAS include:
  - a. A completely occluded left renal artery with an 80% stenosis on the right and a rapidly climbing creatinine
  - b. Frequent hospital admissions for flash pulmonary edema with bilateral stenoses of >70%
  - c. Unilateral RAS of 90% with blood pressures 130-140/80-90 mm Hg on 3 medications
  - d. a. and b.
  - e. All of the above
4. Which of the following classes of antihypertensives have proven benefit in RAS?
  - a. Alpha blockers
  - b. Angiotensin II receptor blockers
  - c. Beta-blockers
  - d. Calcium channel blockers and ACE inhibitors
5. A 72-year-old woman with a history of hyperlipidemia, a 100-pack-year history of smoking, and a 10-year history of hypertension is found to have a creatinine of 3. Her urinalysis is unremarkable except for minimal proteinuria with a protein/creatinine ratio of 0.5. Her ultrasound shows a left

kidney size of 10.5 and a right kidney size of 9.0. MRA demonstrates a high-grade stenosis on the right and minimal stenosis on the left. There is also diffuse aortoiliac disease. Her blood pressure in the office is 150/70 mm Hg on a diuretic and beta-blocker. What should be done next?

- a. Aortobifemoral bypass
- b. Plain old balloon angioplasty of the right renal artery
- c. Percutaneous transluminal renal angioplasty (PTRA) and stent to the right renal artery
- d. Smoking cessation, lipid lowering, and tight blood pressure control
- e. a and d
- f. b and d

6. A 55-year-old man presents with new-onset hypertension that is difficult to control. He is otherwise well, but has a 30 pack-year smoking history. The family history is negative for hypertension. An MRA reveals the presence of a high-grade left RAS with a normal right renal artery. The patient undergoes angiography, which demonstrates a 90% stenosis near the origin of the left renal artery. PTRA and stenting are performed, after which blood pressure normalizes, allowing withdrawal of all antihypertensive medications. On a return visit 3 months later, hypertension is again noted. Two months later, he is back on maximal doses of 3 antihypertensive medications with a measured blood pressure of 150/94 mm Hg. What is the appropriate next step?

- a. Add a fourth blood pressure medication
- b. Refer the patient for an MRA of the left renal artery
- c. Refer the patient for duplex ultrasonography with Doppler
- d. Refer the patient for repeat angiography
- e. None of the above, the blood pressure is adequately controlled

7. The degree of anatomic RAS is highly correlated with renal function and glomerular filtration rate in patients.

True

False

To receive AMA category 1 credit, you must correctly answer 60% of the test questions.

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