A 63-year-old woman with extensive atherosclerotic vascular disease, including long-standing renal artery stenosis, was evaluated for newly uncontrolled hypertension with frequent headaches despite the use of 4 antihypertensive agents. Her blood pressure had been well controlled previously. She had a remote history of right renal artery occlusion and had undergone left renal artery stenting 9 years before presentation. In-stent restenosis had been treated twice with balloon angioplasty since that time. Repeat duplex ultrasound was ordered for suspicion of recurrent in-stent restenosis.

Duplex ultrasound of the left renal artery with the patient in the supine position demonstrated peak systolic and end-diastolic velocities of 286 and 70 cm/s, respectively, with a renal artery–to-aorta ratio of 3.4 (Figure 1). With the patient in the right lateral decubitus position, velocities increased to 453 and 117 cm/s, respectively, and the renal artery–to-aorta ratio increased to 5.4, consistent with significant renal artery stenosis (Figure 2). The patient was referred for renal angiography, which demonstrated mild to moderate in-stent restenosis of the left renal artery in the supine position (Figure 3) and severe, >70% stenosis in the right lateral decubitus position, with a translesional gradient of 40 mm Hg (Figure 4). The dynamic narrowing was localized within the stent, rather than in the bent segment beyond the stent, which would be expected with decubitus positioning. Balloon angioplasty was performed, which resulted in 20% residual in-stent restenosis and no translesional gradient. Postprocedural renal ultrasound performed 1 month later showed normal left renal artery velocities, and no changes in peak systolic or end-diastolic velocities were noted in the right lateral decubitus position.

At a follow-up visit 5 months later, 1 of the 4 blood pressure agents being used by the patient was discontinued owing to symptomatic hypotension. To the best of our knowledge, this is the first reported case of angiographically proven positionally dependent renal artery stenosis resulting in uncontrolled hypertension in a patient with a single functioning kidney. This case could represent a variant of nephroptosis, but the mechanism of this unusual finding, as well as its potential significance in clinical practice and the vascular laboratory, is unknown.

None.

Reference
Figure 3. Digital subtraction angiography of the left renal artery demonstrated mild to moderate in-stent restenosis in the supine position.

Figure 4. Digital subtraction angiography of the left renal artery demonstrated >70% in-stent restenosis when the patient was in the right lateral decubitus position, with a translesional pressure gradient of 40 mm Hg.
Positionally Dependent Renal Artery Restenosis
Esther S.H. Kim, Susan Whitelaw, Christopher T. Bajzer and Heather L. Gornik

_Circulation_. 2009;120:714-715
doi: 10.1161/CIRCULATIONAHA.108.827923
_Circulation_ is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2009 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/120/8/714

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in _Circulation_ can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to _Circulation_ is online at:
http://circ.ahajournals.org//subscriptions/