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Posterior nutcracker syndrome: an infrequent cause of hematuria

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Figure 1 | Computed tomography showed prominent left renal vein with retroaortic course (top panel) and compressed between the aorta and the vertebral body (bottom panel). Ao, Aorta; LRV, left renal vein; Ve, vertebral body.

A 44-year-old man presented to the hospital with gross hematuria and left flank pain. His relevant medical history included Marfan syndrome, a DeBakey type 1 aortic dissection repair, and St Jude's prosthetic aortic valve replacement in 2008 requiring chronic anticoagulation with warfarin. International normalized ratio was 2.9 on admission and warfarin was discontinued. A contrast-enhanced



Figure 2 | Left renal venogram showed poor drainage of contrast from the left renal vein (left panel). Post-intervention venogram showed prompt drainage of contrast from the left renal vein into the azygos vein (right panel). AV, azygos vein; GV, gonadal vein; LRV, left renal vein.

computed tomography scanning of the abdomen and pelvis demonstrated blood in the left renal pelvis. The dissection extended into abdominal aorta, which was dilated. There was symmetric perfusion of both kidneys without evidence of mass or calculus. A prominent left renal vein was noted with a compressed, retroaortic communication with the azygos vein (Figure 1). There was also an anomalous communication between the azygos vein and the inferior vena cava. Urine culture was negative. Cystoscopy showed blood clots in the left collecting system without evidence of malignancy. The patient's hematuria continued while receiving intravenous heparin. A left renal arteriogram was normal. A selective left renal venogram confirmed extrinsic compression at the aorta with an elevated venous gradient of 6 mm Hg. The left retroaortic renal vein was primarily stented with a 10 by 37 mm biliary express balloon expandable stent with correction of compression and resolution of venous pressure gradient (Figure 2). The hematuria resolved and had not recurred with reinitiating warfarin therapy. This patient had gross hematuria secondary to posterior nutcracker syndrome characterized by compression of the anomalous retroaortic left renal vein between the aorta and the spine. With anterior nutcracker syndrome, the left renal vein is compressed between the aorta and the superior mesenteric artery. Left renal venous hypertension from extrinsic left renal vein compression should be considered in the differential diagnosis of hematuria, especially in cases with involvement of the left kidney. Renal vein stenting can be a less-invasive treatment alternative to surgery in managing patients with persistent hematuria.