Shaping Tomorrow's Nephrology: Insight-Driven Kidney Care
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Nutcracker Syndrome Presenting as Chronic Isolated Microscopic Hematuria in an 18-Year-Old Male: The Value of Stepwise Vascular Imaging to Avoid Renal Biopsy

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Case Study : Nutcracker syndrome (NCS) is a vascular compression disorder in which the left renal vein (LRV) is entrapped between the abdominal aorta and the superior mesenteric artery, leading to renal venous hypertension and hematuria of vascular origin. Although the anatomic mechanism is well described, NCS may be underrecognized in adolescents and young adults because it can mimic isolated glomerular hematuria, and CT-based evaluation is often deferred due to radiation concerns. An 18-year-old male presented with longstanding asymptomatic microscopic hematuria incidentally noted since elementary school. He was normotensive (120/80 mmHg) with preserved kidney function (normal serum creatinine). Urinalysis showed no significant proteinuria. Urine microscopy revealed no dysmorphic red blood cells, and autoimmune serologies (ANA, ANCA) were negative. Renal ultrasonography demonstrated no parenchymal abnormality or hydronephrosis. Given persistent isolated hematuria without supportive findings for a glomerular or systemic etiology, contrast-enhanced abdominopelvic CT was performed. Imaging demonstrated marked narrowing of the LRV within the aortomesenteric angle with upstream dilatation, findings consistent with anterior NCS. Because an anatomic cause of hematuria was identified on noninvasive imaging and the patient remained stable and asymptomatic, renal biopsy was deferred. The patient is currently managed conservatively with observation and outpatient follow-up. This case highlights the clinical value of integrating stepwise vascular imaging into the diagnostic algorithm for chronic isolated hematuria. When proteinuria is absent and urinary sediment lacks dysmorphic erythrocytes, NCS should be considered early in the differential diagnosis. Doppler ultrasonography can serve as an initial screening modality, followed by CT venography/angiography or MR angiography when confirmatory anatomic assessment is needed. Strategic imaging before renal biopsy may reduce avoidable procedures, lessen patient burden, and facilitate appropriate conservative management with longitudinal surveillance.

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