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On the Cover

What is the diagnosis?

A 14-year-old female presented for medical care with edema and gross hematuria for 7 days. Laboratory examinations showed AKI (creatinine, 4.6 mg/dl) with nephrotic range proteinuria (UACR, 4.3 mg/g) as well as sterile pyuria and glomerular hematuria. Moreover, her serum ANA (>1:3200) and double-stranded DNA were positive with hypocomplementemia (C3, 0.12 g/L; C4, 0.04 g/L) and pancytopenia (white blood cell, 2.78 G/L; Hb, 69 g/L; Plt, 32 G/L). A tentative diagnosis of lupus nephritis was made, and a kidney biopsy was performed.

Image Description:

An enlarged and lobular glomerulus with prominent mesangial and endothelial proliferative features was seen. Marked endocapillary hypercellularity was noted with numerous inflammatory cell infiltrates. More conspicuously, neutrophils were seen migrating to the urinary pole of Bowman's capsule and into the proximal tubule (outlined by a black line) forming a rudiment of a neutrophil cast (*). (HE staining; magnification, left ×200, right ×400)

Teaching Points:

Sterile pyuria is not uncommon in active glomerulonephritis or interstitial nephritis, such as acute glomerulonephritis, membranous proliferative glomerulonephritis, lupus nephritis, Kawasaki's disease, and analgesic nephropathy—and it usually correlates with the activity or the severity of disease. This picture vividly illustrated the forming of noninfectious neutrophil cast in proliferative lupus nephritis, which was originated from the circulated inflammatory cells crossing over the impaired filtration barrier and subsequently surging to the urinary pole of Bowman's capsule under fluid pressure.

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(Image and text provided by Hua Su, Cheng Wan, and Chun Zhang, Department of Nephrology, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China)