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On the Cover

What is the diagnosis?

A previously healthy 37-year-old Black man presented to the emergency room (ER) with a 3-day history of fever, nonproductive cough, and headache. Initial evaluation revealed a fever of 39.4°C, SpO₂ 99% on room air, and elevated BP of 207/113, and lung exam was clear bilaterally. Chest x-ray showed prominent interstitial markings, and computed tomography revealed nonspecific bilateral pneumonitis. Laboratory results showed a serum creatinine 2.1 mg/dl, albumin 3.0 g/dl, total cholesterol 220 mg/dl, and LDL cholesterol 123 mg/dl. He was empirically treated with ceftriaxone and azithromycin, and respiratory viral testing was subsequently positive for coronavirus disease 2019 (COVID-19) infection. He was discharged from the ER on amlodipine 10 mg and losartan 50 mg daily, with instructions to self-quarantine.

Ten days later, the patient returned to the ER with continued intermittent fevers, chills, and fatigue, but was found to be afebrile and with BP 120/64. A physical exam was significant for clear lungs and 1+ lower extremity edema to his knees. Laboratory results showed a serum creatinine of 11.5 mg/dl, BUN of 69 mg/dl, albumin 1.2 g/dl, total cholesterol 550, and LDL 377 mg/dl. Alanine aminotransferase was 89 U/L and aspartate aminotransferase was 110 U/L. HIV antibody was negative. Urinalysis revealed 3+ protein, trace blood, 6–10 red blood cells/high-power field, many white blood cells/high-power field, and a urine protein-creatinine ratio of 22.4 g/g. Kidney ultrasound showed echogenic kidneys.

Image Description:

Left image: Glomeruli exhibited collapsing features with rim of epithelial cells (hematoxylin and eosin ×200). No cellular or fibrous crescents were noted. No vasculitis was noted.

Left center image: Glomerulus with collapsing features (periodic acid–Schiff ×200).

Right center image: Focal collapse of glomerular capillary loops and diffuse foot process effacement (electron microscopy ×3360).

Right image: Endothelial cell tubuloreticular inclusions (arrow, electron microscopy ×43,800). No subepithelial, intramembranous, subendothelial, or mesangial immune-type electron-dense deposits were identified.

Teaching Points:

- Kidney biopsy diagnosis is collapsing glomerulopathy with diffuse foot process effacement, tubuloreticular inclusions in endothelial cells, and evidence of acute tubular injury in the setting of COVID-19 infection.
- Collapsing glomerulopathy in the setting of COVID-19 infection can present with rapidly progressive kidney failure and nephrotic syndrome.
- COVID-19-related collapsing glomerulopathy can worsen even after upper respiratory tract symptoms have resolved. This points to a lag between COVID-19 symptom resolution and worsening kidney disease.

Although there are no data on treating COVID-19-related collapsing glomerulopathy, the patient was treated with methylprednisolone 1 g intravenously daily for 3 days starting on his second day of hospitalization. He was then transitioned to prednisone 40 mg daily. He remained afebrile throughout admission and did not require KRT. His serum creatinine did not start improving until day 7 of his hospitalization, and he was discharged on day 10 with a serum creatinine of 6.2 mg/dl with plans to follow up as an outpatient. (Images and text provided by Fahim Malik¹, Ali Ghorbani¹, and Judy King,² ¹Washington Nephrology Associates, Rockville, Maryland and ²Department of Pathology and Translational Pathobiology, Ochsner LSU Health, Shreveport, Louisiana)