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An Under-recognized Cause of CKD

CLINICAL PRESENTATION

A 47-year-old woman was evaluated for decreasing kidney function. In 2008, serum creatinine level was 0.89 mg/dL (79 μmol/L; estimated glomerular filtration rate [eGFR] >60 mL/min/1.73 m^2 [>1 mL/s/1.73 m^2], calculated using the 4-variable MDRD [Modification of Diet in Renal Disease] Study equation) and had been stable for 5 years. In 2009, it increased to 1.26 mg/dL (111 μmol/L; eGFR, 49 mL/min/1.73 m^2 [0.82 mL/s/1.73 m^2]), 1.62 mg/dL (143 μmol/L; eGFR, 37 mL/min/1.73 m^2 [0.62 mL/s/1.73 m^2]), and then 2.15 mg/dL (190 μmol/L; eGFR, 26 mL/min/1.73 m^2 [0.43 mL/s/1.73 m^2]) by March 2010. Medical history included anorexia nervosa, deliberate self-harm, left hip fracture, and chronic pain syndrome. Prescribed medications were gabapentin, naproxen, ranitidine, cyclizine, and acetaminophen.

On evaluation, the patient was concerned about a 2-week history of lethargy with decreased oral intake. She appeared cachectic and malnourished on examination. Weight was 33 kg, body mass index was 14.1 kg/m^2, blood pressure was 137/96 mm Hg, and she was clinically volume depleted. Initial blood tests (Table 1) showed decreased kidney function with creatinine level of 2.9 mg/dL (256 μmol/L; eGFR, 18 mL/min/1.73 m^2 [0.3 mL/s/1.73 m^2]). Urinalysis showed protein (+), and spot urine protein-creatinine ratio was 5.86 mg/mg. A kidney ultrasound scan showed 9-cm kidneys bilaterally. There was marked prominence of the kidney pyramids, but collecting systems were not dilated. A kidney biopsy was performed (Fig 1).

Table 1. Laboratory Data at Presentation

Parameter	Value	Ref Range
Hemoglobin (g/dL)	11.5	12.0-16.0
WBC count (× $10^3/\mu L$)	4.4	4.0-11.0
Platelets (× $10^3/\mu L$)	265	150-350
SUN (mg/dL)	8.3	7.0-18.0
Sodium (mEq/L)	140	133-146
Potassium (mEq/L)	3.3	3.5-5.4
Creatinine (mg/dL)	2.90	0.60-1.20
eGFR (mL/min/1.73 m^2)	18	>60
Bicarbonate (mEq/L)	10	18-23
Albumin (g/dL)	3.2	3.5-5.0
Calcium (mg/dL)	9.00	8.20-10.60
Phosphate (mg/dL)	3.25	3.00-4.50
Magnesium (mEq/L)	2.19	1.90-2.70
Bilirubin (mg/dL)	0.23	Up to 1.00
ALT (U/L)	9	1-21
ALP (U/L)	355	30-200
Glucose (mg/dL)	23.4	70.0-110.0
Thyrotropin (mIU/L)	7.70	0.5-4.94
Free T_4 (ng/dL)	9	0.7-1.5
24-h proteinuria (g/d)	2.6	<0.03
24-h CCr (mL/min)[a]	14	
Urine PCR (mg/mg)	5.86	

Note: Conversion factors for units: hemoglobin in g/dL to g/L, ×10; SUN in mg/dL to mmol/L, ×0.357; creatinine in mg/dL to μmol/L, ×88.4; eGFR in mL/min/1.73 m^2 to mL/s/1.73 m^2, ×0.01667; albumin in g/dL to g/L, ×10; calcium in mg/dL to mmol/L, ×0.2495; magnesium in mEq/L to mmol/L, ×0.5; bilirubin in mg/dL to μmol/L, ×17.1; glucose in mg/dL to mmol/L, ×0.05551; T_4 in ng/dL to pmol/L, ×12.87; CCr in mL/min to mL/s, ×0.01667. No conversion necessary for sodium, potassium, and bicarbonate in mEq/L and mmol/L and WBC and platelet counts in × $10^3/\mu L$ and × $10^9/L$.

Abbreviations: ALP, alkaline phosphatase; ALT, alanine aminotransferase; CCr, creatinine clearance; eGFR, estimated glomerular filtration rate; PCR, protein-creatinine ratio; ref, reference; SUN, serum urea nitrogen; T_4, thyroxine; WBC, white blood cell.

[a]Based on serum creatinine level of 2.24 mg/dL.

- **What are the kidney biopsy findings and what is the pathologic diagnosis?**
- **What processes may cause these findings?**
- **What is the diagnosis?**
- **How might this patient be treated and what is the long-term kidney prognosis?**

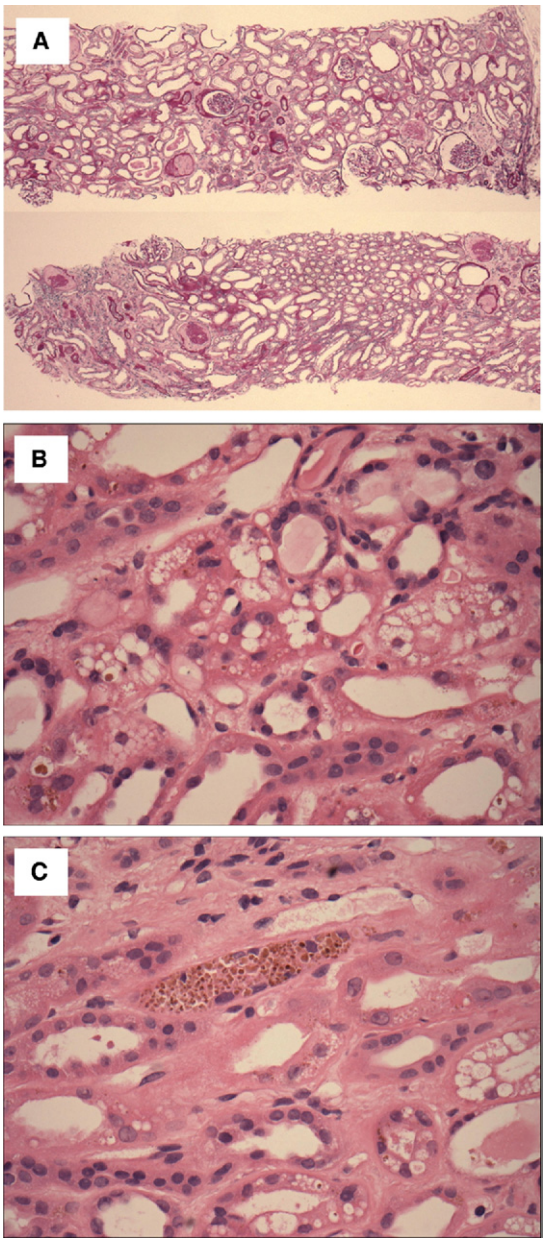

Figure 1. Kidney biopsy specimen. (A) Periodic acid–Schiff; original magnification, ×40. (B) Hematoxylin and eosin; original magnification, ×200. (C) Hematoxylin and eosin; original magnification, ×400.