IMAGE OF INTEREST

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Crystals in a patient with asymptomatic proteinuria

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A 64-year-old male was referred to our hospital for evaluation of proteinuria. His medical history and physical examination were unremarkable. Laboratory findings revealed a white blood cell count of 4,900/mm^3, hemoglobin level of 12.9 g/dL, platelet count of 157,000/mm^3, blood urea nitrogen level of 18 mg/dL, and serum creatinine level of 0.77 mg/dL. Urinalysis showed 2+ proteinuria without hematuria. His 24-hour urine protein level was 920 mg/day. Serum protein electrophoresis showed a small M peak, and serum protein immunofixation showed monoclonal gammopathy with an immunoglobulin G (IgG) κ-light chain. A bone marrow biopsy revealed normocellular marrow with minor monoclonal plasma cell infiltration (<5%). The patient subsequently underwent a renal biopsy. Histologically, the size and cellularity of the glomeruli were normal with patent capillary lumina (Fig. 1A). Immunofluorescence staining was positive for κ-light chains in the tubular cytoplasm, but there was no staining for IgG, IgM, IgA, λ-light chain, C3, or C1q (Fig. 1B). Under electron microscopic examination, the proximal tubules contained sparsely scattered or abundantly packed rhomboid and rod-shaped medium electron-dense crystals in the cytoplasm with segmental loss of microvillus surfaces (Fig. 1C). These findings are consistent with light chain proximal tubulopathy (LCPT) with crystal formation. Despite significant crystalline deposition in the proximal tubules, there was no evidence of Fanconi syndrome, and the patient had no metabolic or bone abnormalities. One year after diagnosis, the patient's hematologic and renal functions were stable without treatment.

Diagnosis of light chain crystal deposition may be challenging because the clinical and pathological manifestations are uncommon and poorly characterized, sometimes resulting in an incorrect or missed diagnosis. Although this patient

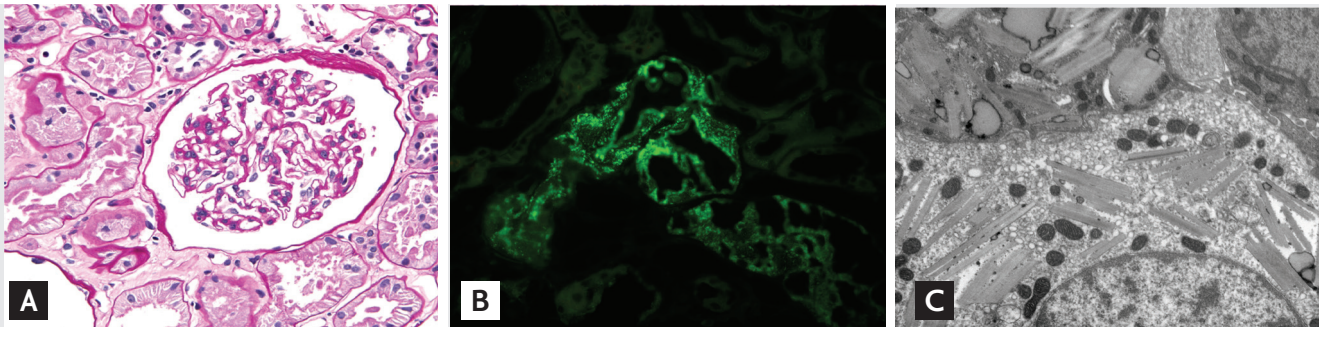

Figure 1. Renal histology. (A) Light microscopic findings showed that the glomeruli appeared normal in size and cellularity (×400). (B) Immunofluorescence findings showed positive staining for κ-light chain in the proximal tubules (×400). (C) Electron microscopy showed that the proximal tubules contained numerous rhomboid and rod-shaped, electron-dense crystals and lysosomes in the cytoplasm and tubular cast (×2,500).

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presented with clinically asymptomatic proteinuria, a high index of suspicion was necessary to achieve an accurate diagnosis of LCPT without Fanconi syndrome. Diagnostic work-up for asymptomatic proteinuria should include protein electrophoresis and ultrastructural examination of renal biopsy specimens.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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