

Congress Abstract

AL Amyloidosis with Renal and Cardiac Involvement Without Kidney Biopsy: A Diagnostic Challenge Resolved by Fat Pad Biopsy

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ABSTRACT

Background: Immunoglobulin light-chain (AL) amyloidosis is a rare plasma cell dyscrasia caused by deposition of misfolded monoclonal light chains, with the kidneys and heart among the most frequently affected organs. Kidney biopsy is the diagnostic gold standard; however, in patients with severe hypoalbuminemia, coagulopathy, and high bleeding risk, an alternative tissue site may be required. We present a case of severe renal involvement in AL amyloidosis in which diagnosis was established despite an initially negative surrogate-site biopsy and contraindication to kidney biopsy.

Case Presentation: A 70-year-old woman initially presented with urticaria, fever, arthralgia, epistaxis, leukopenia, eosinophilia, and severe thrombocytopenia ($13 \times 10^9/L$). Bone marrow examination excluded hematological malignancy, and the thrombocytopenia subsequently resolved without specific therapy. Three months later, she developed generalized edema, hypotension, oliguria, dyspnea, pleural effusions, and ascites. Severe nephrotic syndrome was identified, with proteinuria up to 49.5 g/day, serum albumin 12–17.4 g/L, creatinine 170 $\mu\text{mol/L}$, and eGFR 28 mL/min/1.73 m². Urine immunofixation revealed lambda Bence-Jones protein (3.9 g/day), while serum immunofixation was negative. Extensive autoimmune testing was unrevealing.

AL amyloidosis was suspected because of nephrotic-range proteinuria and monoclonal lambda light-chain secretion. Rectal mucosal biopsy was Congo red-negative. Kidney biopsy was considered high-risk because of profound hypoalbuminemia, coagulation abnormalities, previous severe thrombocytopenia, and bleeding risk. Repeat bone marrow examination and flow cytometry subsequently demonstrated a minor monoclonal plasma-cell population without criteria for active multiple myeloma.

Bone marrow histology showed no amyloid deposits. However, abdominal subcutaneous fat pad biopsy demonstrated Congo red-positive deposits with characteristic apple-green birefringence under polarized light, confirming systemic AL amyloidosis. Cardiac involvement was supported by elevated NT-proBNP (4731 pg/mL) and concentric left ventricular hypertrophy with preserved ejection fraction (58%).

Treatment with daratumumab, bortezomib, cyclophosphamide, and corticosteroid (Dara-CBorD) was initiated. Following early treatment, renal and cardiac parameters improved: urinary protein became undetectable, renal function improved, and NT-proBNP decreased from 4731 to 1180 pg/mL, representing a 75% reduction.

Conclusion: This case demonstrates that AL amyloidosis should remain strongly suspected despite a negative surrogate-site biopsy when clinical and laboratory findings indicate monoclonal light-chain-mediated disease. When kidney biopsy carries prohibitive bleeding risk, abdominal fat pad biopsy can provide definitive

minimally invasive histological confirmation. Close collaboration between nephrologists, hematologists, and pathologists enabled diagnosis without kidney biopsy and facilitated early clone-directed therapy, resulting in rapid renal and cardiac improvement.

Keywords: AL Amyloidosis; Renal Amyloidosis; Cardiac Amyloidosis; Nephrotic Syndrome; Fat Pad Biopsy; Kidney Biopsy