

Plasma Cell Leukemia with A “Missing” Monoclonal Protein on Immunofixation

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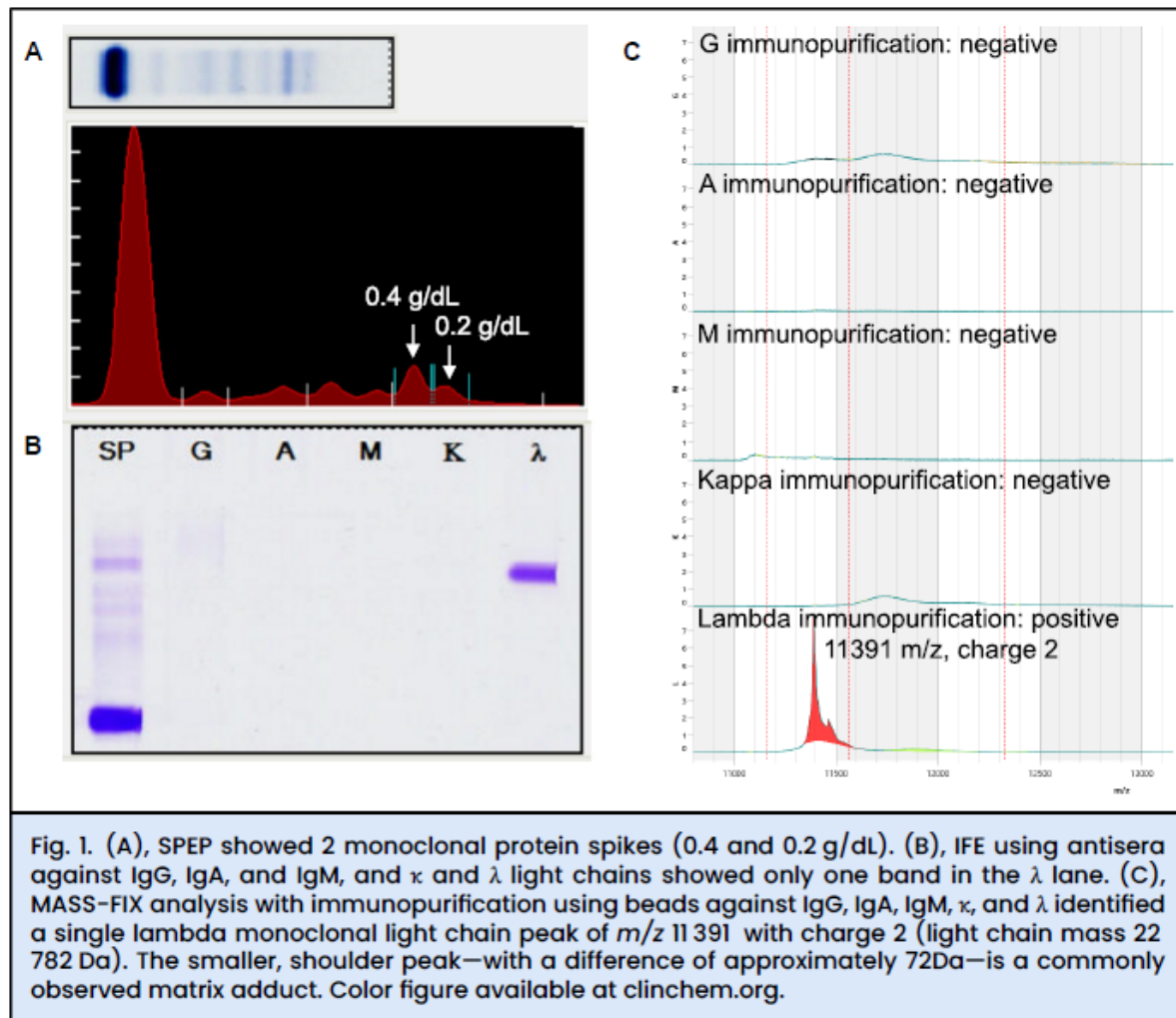
CASE DESCRIPTION

A 64-year-old male presented with weight loss, fatigue, and abdominal pain. Imaging demonstrated multifocal abdominal and retroperitoneal lymphadenopathy. Laboratory evaluation revealed significant leukocytosis ($>50\text{--}60 \times 10^9/\text{L}$), a substantial creatinine elevation (3.3 mg/dL) and reduced estimated glomerular filtration rate (eGFR) (20 mL/min/1.73 m²), two low-level monoclonal (M)-protein spikes (0.4 and 0.2 g/dL) on SPEP (Fig. 1A), and markedly elevated λ free light chains (FLCs; $\lambda >11\,000$ mg/L, κ 5 mg/L, and $\kappa/\lambda <0.01$) for which the patient received plasma exchange. Peripheral blood smear and flow cytometry identified approximately 80% of circulating leukocytes as plasma cells. Bone marrow biopsy demonstrated 95% hypercellularity with atypical anaplastic cells and high-grade cytologic features. A retroperitoneal core biopsy revealed an aggressive plasmacytoid neoplasm with plasmablastic features, consistent with PCL involving extramedullary sites.

IFE showed one band in the λ lane (Fig. 1B), in contrast to SPEP, which had shown the 2 low-level M-protein spikes in the gamma region (both SPEP and IFE were performed using Helena SPIFE 4000). In addition, analysis of M-proteins by mass spectrometry using MASS-FIX (1) identified a single monoclonal λ light chain of 22 782 Da without detection of a corresponding heavy chain (Fig. 1C).

QUESTIONS TO CONSIDER
1. What is plasma cell leukemia (PCL) and how is it diagnosed?
2. Why did the patient receive plasma exchange?
3. What may cause a band on serum protein electrophoresis (SPEP) that is not visible on standard immunofixation or MASS-FIX?
4. What is the suspected identity of the “missing” band on immunofixation electrophoresis (IFE) and what follow-up actions would you take?

Continued below....



REFERENCE

1. Milani P, Murray DL, Barnidge DR, Kohlhagen MC, Mills JR, Merlini G, et al. The utility of mass-fix to detect and monitor monoclonal proteins in the clinic. *Am J Hematol* 2017;92: 772–9.

Final Publication and Comments

The final published version with discussion and comments from the experts will appear in the September 2026 issue of *Clinical Chemistry*. To view the case and comments online, go to <https://academic.oup.com/clinchem/issue/72/9> and follow the link to the Clinical Case Study and Commentaries.

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